SONY

COLOR VIDEO CAMERA

BVP-500
BVP-500P

Digital 1000

MAINTENANCE MANUAL

Volume 1 1st Edition (Revised 2)

BVP-500 (UC) Serial No. 10001 and Higher

BVP-500P (CE) Serial No. 40001 and Higher

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理など行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠ AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres. Pour toute réparation faire appel à une personne compétente uniquement.

Table of Contents

Manual Structure

Purpose of this manual 3
Contents 3
Relative manuals 4

1. Installation

1-1. Supplied Accessories 1-1
1-2. Connectors and Cables 1-1
1-2-1. Connector Input/Output Signals 1-1
1-2-2. Connection Connector 1-5
1-2-3. Wiring Diagram for Cable 1-5
1-3. Outside Dimentions 1-6
1-4. Installaton Conditions 1-8
1-5. Function of Internal Switches/Controls 1-8
1-6. Instance of Sytem Configuration 1-12

2. Service Overview

2-1. Opening and Closing the Side Panel 2-1
2-2. Location of Printed Circuit Boards 2-1
2-3. Circuit Description 2-2
2-4. Description of EEPROM Data 2-5
2-5. Disconnecting/Connecting Flexible Card Wire 2-6
2-6. Replacement of Board 2-7
2-6-1. Note on Replacement of Parts 2-7
2-6-2. Replacement of CN-988/989/990 Board 2-7
2-6-3. Replacement of PR-211 Board 2-7
2-7. Replacement of Power Assembly 2-8
2-7-1. Replacement of Power Assembly 2-8
2-7-2. Removal of PS-392 Board and AC.DC/DC Convertor 2-8
2-8. Periodic Replacement Part 2-10
2-9. Tools and Fixtures 2-11
2-9-1. Tools and Fixtures 2-11
2-9-2. Use of Portable Lens Attachment 2-11
2-10. Notes on Repair Parts 2-12

3. Setup Menu

3-1. Setup Menu 3-1
3-1-1. Operation Menu 3-3
3-1-2. Paint Menu 3-7
3-1-3. Maintenance Menu 3-10
3-1-4. Reference Menu 3-13
3-1-5. Triming Menu 3-13
3-1-6. System Config Menu 3-14
3-2. Self-Diagnosis 3-18

4. Alignment for OHB Installation

4-1. Preparation 4-1
4-1-1. Equipment Required 4-1
4-1-2. Notes on Adjustment 4-2
4-1-3. Description of Setup Menu 4-2
4-1-4. Connection 4-3
4-1-5. Initial Settings 4-4
4-2. VCO CONT Frequency Confirmation 4-5
4-3. VA Gain Adjustment 4-5
4-4. Black Shading Adjustment 4-7
4-5. White Shading Adjustment 4-9
4-6. Master Black Adjustment 4-10
4-7. Gamma Correction Adjustment 4-10
4-8. Flare Adjustment 4-12
4-9. Knee and White Clip Adjustment 4-13
4-10. Crispening Adjustment 4-14
4-11. Level Dependent Adjustment 4-15
4-12. Detail Frequency Adjustment 4-16
4-13. H/V Ratio Adjustment 4-17
4-14. Detail Level Adjustment 4-17
4-15. Detail Clip Adjustment 4-18
4-16. Skin Tone Adjustment 4-19
4-17. Zebra Adjustment 4-20
4-18. Auto Iris Adjustment 4-21
4-19. Settings After Finishing Adjustment 4-22
4-20. File Store 4-22

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5. Overall Electrical Alignment

5-1. Preparation 5-1
5-1-1. Equipment Required 5-1
5-1-2. Notes on Adjustment 5-2
5-1-3. Description of Setup Menu 5-2
5-1-4. Connection 5-3
5-1-5. Initial Settings 5-4
5-2. VCO CONT Frequency Adjustment 5-5
5-3. CCU Y Adjustment 5-6
5-4. Monitor Out Adjustment 5-7
5-5. Chroma Adjustment 5-8
5-6. INT SC Phase Adjustment 5-9
5-7. VF Level Adjustment 5-10
5-8. TEST 1 Adjustment 5-11
5-9. TEST 2 Adjustment 5-12
5-10. A/D Gain Adjustment 5-13
5-11. VA Gain Adjustment 5-15
5-12. VA MOD Adjustment 5-17
5-13. Black Shading Adjustment 5-18
5-14. White Shading Adjustment 5-19
5-15. Master Black Adjustment 5-20
5-16. Gamma Correction Adjustment 5-21
5-17. Flare Adjustment 5-22
5-18. Pre Knee Adjustment 5-23
5-19. Knee and White Clip Adjustment 5-25
5-20. A/D CLOCK PHASE Adjustment 5-26
5-21. CCU Y/R-Y/B-Y Adjustment 5-27
5-22. Settings After Finishing Adjustment 5-28
5-23. Audio Modulation/Demodulation Adjustment 5-29
5-23-1. BATTERY ALARM SET Adjustment 5-29
5-23-2. MIC 1 RF Adjustment 5-30
5-23-3. MIC 2 RF Adjustment 5-30
5-23-4. MIC 1 DEVIATION Adjustment 5-30
5-23-5. MIC 2 DEVIATION Adjustment 5-31
5-23-6. INCOM RF Adjustment 5-31
5-23-7. INCOM DEVIATION Adjustment 5-32
5-23-8. DATA RF Adjustment 5-32
5-23-9. INCOM Demodulation Adjustment 5-33
5-23-10. PGM Demodulation Adjustment 5-34
5-23-11. DATA Demodulation Circuit Adjustment 5-35
5-23-12. H CONT Demodulation Circuit Adjustment 5-35

5-24. Video Modulation/Demodulation Adjustment 5-36
5-24-1. VCO 45 MHz Adjustment 5-36
5-24-2. Y Level Adjustment 5-36
5-24-3. Y SYNC Cancel Adjustment 5-37
5-24-4. Y/SKIN DC Balance Adjustment 5-37
5-24-5. Y/SKIN 90° Adjustment 5-38
5-24-6. R-Y Level Adjustment 5-38
5-24-7. B-Y Level Adjustment 5-39
5-24-8. R-Y/B-Y Carrier Balance Adjustment 5-39
5-24-9. R-Y/B-Y DC Balance Adjustment 5-40
5-24-10. R-Y/B-Y 90° Adjustment 5-40
5-24-11. 67.5 MHz TRAP Adjustment 5-41
5-24-12. RETURN VIDEO Demodulation Adjustment 5-42
5-24-13. RETURN VIDEO Level Adjustment 5-43
5-24-14. PROMPT VIDEO Demodulation Adjustment 5-43
5-24-15. PROMPT VIDEO RF AGC Adjustment 5-44
5-24-16. PROMPT VIDEO Level Adjustment 5-45

Manual Structure

Purpose of this manual

This manual is the maintenance manual for Color Video Camera BVP-500/500P. This manual describes the information items necessary when the unit is supplied and installed, items on maintenance, and items that premise the service based on the components parts such as alignment, schematic diagrams, board layouts and spare parts list, assuming use of system and service engineers.

Contents

This followings are summaries of the each section for understanding the manual.

Maintenance Manual Volume 1

Section 1. Installation
Describes information about connector input/output signals, instance of configuration and function of internal switches.

Section 2. Service Overview
Describes information about board locations, circuit description, replacement of part and notes on services.

Section 3. Setup menu
Describes information about setup menu and self-diagnosis mode.

Section 4. Alignment of OHB Installation
Describes adjustment necessary for installation of OHB.

Section 5. Overall Electrical Alignment
Describes electrical adjustment necessary for maintenance of the unit or replacement of parts.

Maintenance Manual Volume 2

Section 1. Spare Parts
Describes parts list, exploded views, supplied accessories and fixtures list used in the unit.

Section 2. Semiconductor Pin Assignments
Describes function diagrams and pin names of semiconductor used in the unit.

Section 3. Block Diagrams
Describes overall block diagram and the block diagrams for every circuit board.

Section 4. Schematic Diagrams
Describes schematic diagrams for every circuit board.

Section 5. Board Layouts
Describes board layouts for every circuit board.

Relative manuals

Besides this maintenance manual the following manuals are available for this unit.

- **Operation Manual (Supplied with this unit)**
  This manual is necessary for application and operation of this unit.

- **System manual (Not supplied with this unit)**
  This manual is necessary for connection and operation of this unit and other peripheral equipments.
  If this manual is required, please contact Sony service organization

Section 1
Installation

1-1. Supplied Accessories

Accessories	Sony Part No.	Qt'y
Fuse T2AH 250V	1-576-228-11	1
Fuses T4AH 250V	1-576-231-41	4
Angle Adjustment Brackets	2-280-511-01	2
Clamp Bands	3-186-502-01	2
Number Plate (For Rear panel)	3-167-517-01	1
Number Plates (For Side panels)	3-185-945-01	2
Number Plate (For UP tally lamp)	4-027-937-01	1

1-2. Connectors and Cables

1-2-1. Connector Input/Output Signals

Output Signals

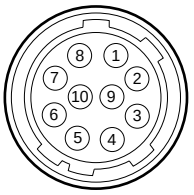
- MONITOR
  BNC 75Ω 1.0 Vp-p
  * Refer to Section 1-5 "Function of Internal Switches and Controls, IF-538 Board" for details.

- PROMPTER
  BNC 75Ω 1.0 Vp-p

Input/Output Signals

- TRIAX
  King type (for BVP-500)
  Fischer type (for BVP-500P)

TRACKER (10P FEMALE)

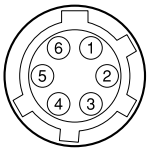


(EXTERNAL VIEW)

No.	SIGNAL	SPECIFICATIONS
1	TRACKER OUT (X)	TRACKER RECEIVE 0 dBu unbalanced
2	TRACKER T OUT (G)	GND for TRACKER T
3	TRACKER R OUT (G)	GND for TRACKER R
4	PGM OUT (X)	–20 dBu unbalanced
5	+12 V (T) OUT	+12 Vdc. 100 mA (MAX)
6	PGM OUT (G)	GND for PGM
7	TRACKER T IN (X)	TRACKER TALK
8	TRACKER T IN (Y)	0 dBu/–20 dBu High impedance balanced
9	UP TALLY OUT (G)	GND for UP TALLY
10	UP TALLY OUT (X)	+12 Vdc 200 mA (MAX)

(0 dBu=0.775 Vrms)

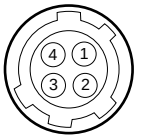
RET CONTROL (6P FEMALE)



(EXTERNAL VIEW)

No.	SIGNAL	SPECIFICATIONS
1	INCOM 1 MIC ON/OFF IN	Zi ≥ 10 kΩ ON:GND OFF:OPEN
2	INCOM 2 MIC ON/OFF IN	Zi ≥ 10 kΩ ON:GND OFF:OPEN
3	GND	
4	RET 3 ON/OFF IN	Zi ≥ 10 kΩ ON:GND OFF:OPEN
5	RET 1 ON/OFF IN	Zi ≥ 10 kΩ ON:GND OFF:OPEN
6	RET 2 ON/OFF IN	Zi ≥ 10 kΩ ON:GND OFF:OPEN

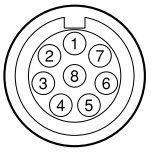
SCRIPT (4P FEMALE)



(EXTERNAL VIEW)

No.	SIGNAL	SPECIFICATIONS
1	GND	GND for POWER
2	NC	No connection
3	NC	No connection
4	+12 V OUT	+12 Vdc.

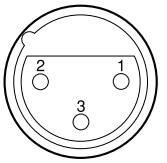
REMOTE (8P FEMALE)



(EXTERNAL VIEW)

No.	SIGNAL	SPECIFICATIONS
1	TX (+)	BVP SERIAL DATA
2	TX (–)	
3	RX (+)	CCU/MSU/RCP/CNU/VCS SERIAL DATA
4	RX (–)	
5	TX GND	GND for TX
6	POWER (+) OUT	+12 V, 500 mA (MAX)
7	POWER (–) OUT	GND for +12 V
8	NC	No connection
	CHASSIS GND	CHASSIS GND

MIC IN CH1/CH2 (3P FEMALE)

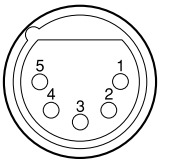


(EXTERNAL VIEW)

No.	SIGNAL	SPECIFICATIONS
1	MIC IN (G)	–60 dBu High impedance balanced
2	MIC IN (X)	
3	MIC IN (Y)	

(0 dBu=0.775 Vrms)

INCOM (5P FEMALE)

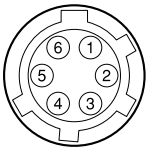


(EXTERNAL VIEW)

No.	SIGNAL	SPECIFICATIONS
1	INCOM MIC IN (Y)	–20 dBu (CARBON MIC) –60 dBu (DYNAMIC MIC)
2	INCOM MIC IN (X)	
3	GND (PGM)	
4	INCOM RECEIVE OUT	0 dBu
5	PGM OUT	0 dBu

(0 dBu=0.775 Vrms)

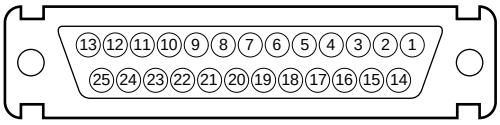
REMOTE (6P FEMALE)



(EXTERNAL VIEW)

No.	SIGNAL	SPECIFICATIONS
1	SERIAL DATA IN	Serial data for camera control
2	SERIAL DATA OUT	
3	UNREG (G)	
4	NC	No connection
5	NC	No connection
6	UNREG OUT	+12 Vdc 100 mA

VF (25P FEMALE)

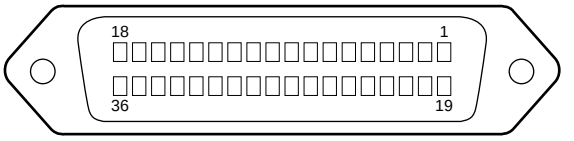


(EXTERNAL VIEW)

No.	SIGNAL	SPECIFICATIONS
1	VF R VIDEO OUT (X)	No connection
2	NC	No connection
3	VF VIDEO OUT (X)	Y/RET Zo=75 Ω ± 5 % 1 Vp-p
4	NC	No connection
5	VF B VIDEO OUT (X)	No connection
6	RET $\overline{\text{ON}}$ OUT	No connection
7	+12 V (VF) OUT	+12 Vdc (at 2 A)
8	+12 V (VF) OUT	+12 Vdc (at 2 A)
9	UP TALLY ON OUT	ON: +12 V OFF: 0 V
10	VF RET VIDEO OUT (X)	No connection
11	R TALLY ON OUT	ON: 5 V ± 0.5 V OFF: 0 + 0.5 V
12	$\overline{\text{VF SEL}}$ $\overline{\text{COL}}$/BW IN	No connection
13	NC	No connection

No.	SIGNAL	SPECIFICATIONS
14	VF R VIDEO OUT (G)	No connection
15	PEAKING OFF OUT	OFF: GND ON: High impedance
16	VF VIDEO OUT (G)	GND for VF VIDEO
17	CHASSIS GND	CHASSIS GND
18	VF B VIDEO OUT (G)	No connection
19	VF DC GND	GND for +12 V (VF)
20	VF DC GND	GND for +12 V (VF)
21	TALLY GND	GND for TALLY
22	VF RET VIDEO OUT (G)	No connection
23	G TALLY ON OUT	ON: 5 V ± 0.5 V OFF: 0 + 0.5 V
24	NC	No connection
25	16:9 ON OUT	ON: GND OFF: High impedance

LENS (36P FEMALE)



(EXTERNAL VIEW)

No.	SIGNAL	SPECIFICATIONS
1	NC	No connection
2	NC	No connection
3	NC	No connection
4	+12 V (LENS) OUT	+12 V (at 2 A)
5	LENS DC GND	GND for +12 V (LENS)
6	GND	GND
7	NC	No connection
8	LENS EXT-A IN	*2
9	LENS EXT-B IN	*2
10	LENS EXT-C IN	*2
11	LENS AUX OUT	ON: GND OFF: High impedance
12	IRIS POSI IN	Zi ≥ 10 kΩ 2 to 7 V “3.4 ± 0.1 V (F16)” “6.2 ± 0.1 V (F2.8)”
13	ZOOM POSI IN	Zi ≥ 10 kΩ 2 to 7 V “2 V (WIDE), 7 V (TELE)”
14	RET 1 $\overline{\text{ON}}$ IN	Zi ≥ 10 kΩ ON:L OFF:High impedance
15	RET 2 $\overline{\text{ON}}$ IN	Zi ≥ 10 kΩ ON:L OFF:High impedance
16	FOCUS POSI IN	Zi ≥ 10 kΩ 2 to 7 V “2 V (MIN), 7 V (∞)”
17	IRIS CONT OUT	2 to 7 V “3.4 ± 0.1 V (F16)” “6.2 ± 0.1 V (F2.8)” Zo ≤ 1 kΩ
18	IRIS $\overline{\text{AUTO}}$/MANU OUT	AUTO: L MANU: H Zo ≤ 1 kΩ

No.	SIGNAL	SPECIFICATIONS
19	NC	No connection
20	NC	No connection
21	LENS R TALLY ON OUT	ON: L OFF: H Zo ≤ 1 kΩ
22	EXP POSITION IN	Zi ≥ 10 kΩ 1 to 4 V 1 V: –7.5° 4 V: +7.5°
23	RET 3 $\overline{\text{ON}}$ IN	Zi ≥ 10 kΩ ON: L OFF: High impedance
24	LENS ADRS A IN	*1
25	LENS ADRS B IN	*1
26	LENS ADRS C IN	*1
27	LENS ADRS D IN	*1
28	EXTENDER 1 $\overline{\text{ON}}$ OUT	ON: GND OFF: High impedance
29	EXTENDER 2 $\overline{\text{ON}}$ OUT	ON: GND OFF: High impedance
30	NC	No connection
31	INCOM 1 ENG/PRD IN	Zi ≥ 10 kΩ ENG: GND PRD: High impedance
32	INCOM 2 ENG/PRD IN	Zi ≥ 10 kΩ ENG: GND PRD: High impedance
33	INCOM MIC 1 $\overline{\text{ON}}$ IN	Zi ≥ 10 kΩ ON: GND OFF: High impedance
34	INCOM MIC 2 $\overline{\text{ON}}$ IN	Zi ≥ 10 kΩ ON: GND OFF: High impedance
35	NC (REGI VD OUT ⎍⎍)	No connection
36	NC (LENS DC GND)	No connection

*1 Zi ≥ 10 kΩ
1: High impedance
0: 0 + 0.5 V
LENS ADRS A (Low-order bit)
LENS ADRS D (High-order bit)

*2 Zi ≥ 10 kΩ
1: High impedance
0: 0 ± 0.5 V

EX1	EX2	EX3	MODE
1	1	1	EXTENDER OFF
1	0	1	EXT-A (× 1.5) ON
0	1	1	EXT-B (× 2) ON
0	0	1	EXT-C (× 2.5) ON

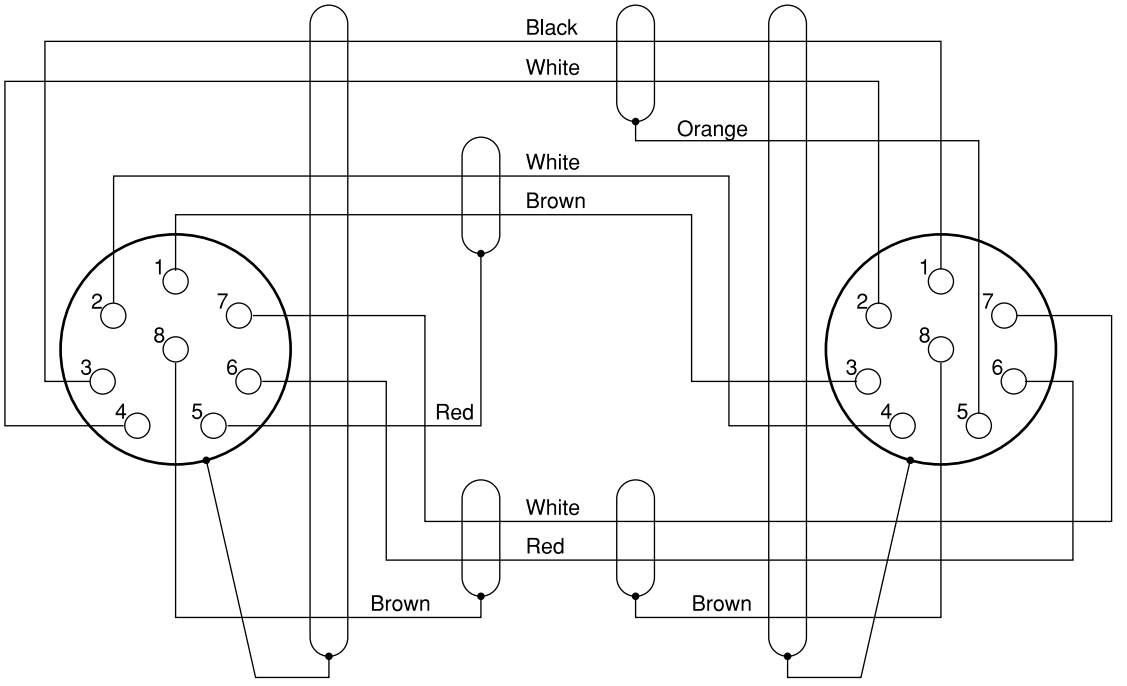
1-2-2. Connection Connector

Connection made with the connector panels during installation or service, should be made with the connectors/complete cable assemblies specified in the following list, or equivalent parts.

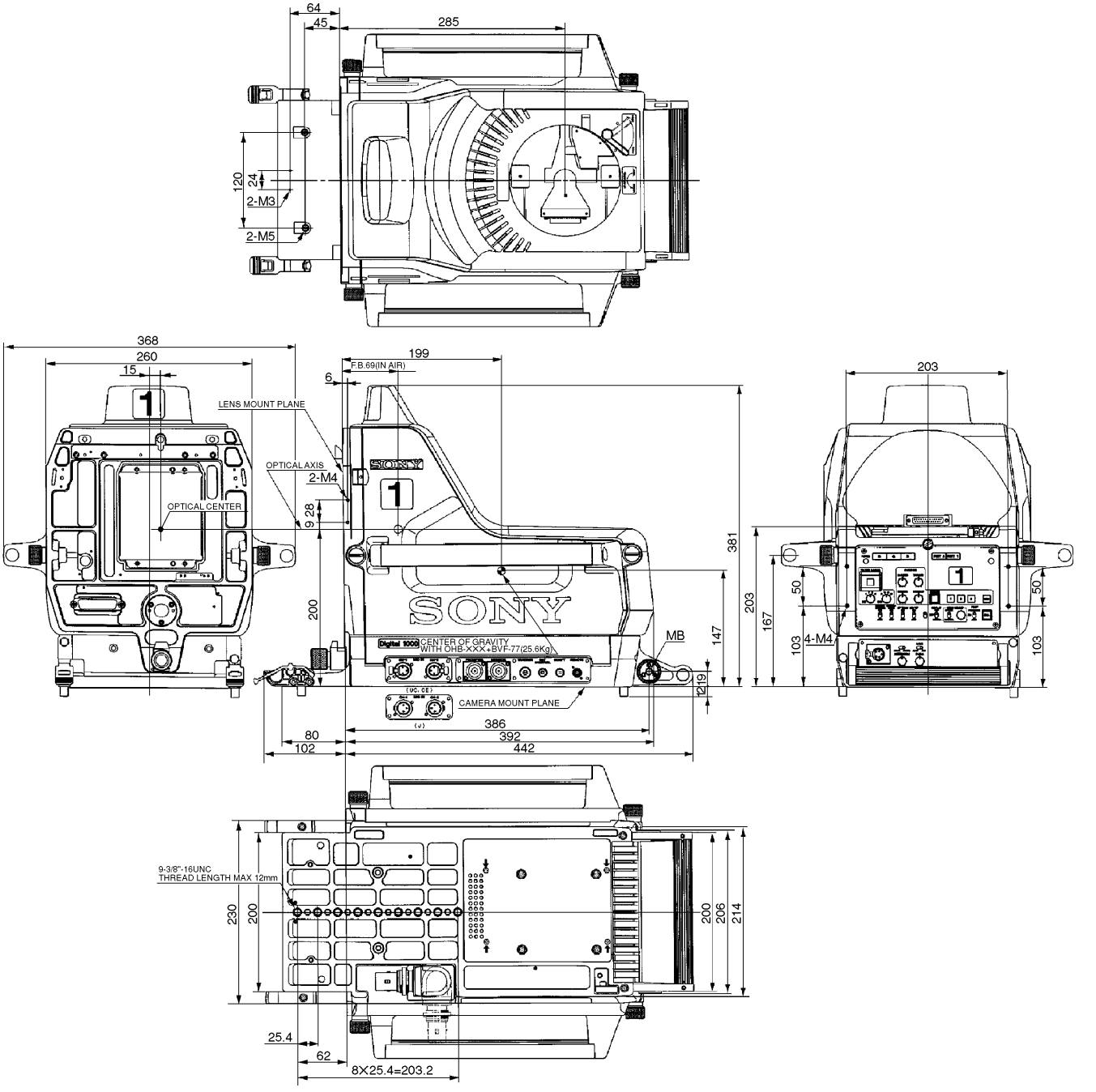
Connector Name	Connection Connectors/Cables
MONITOR PROMPTER (BNC)	1-560-069-11 Plug, BNC or B-B Cable assembly (1.5 m, option)
TRACKER (10P FEMALE)	1-506-522-11 Plug, 10P Male or HIROSE HR10R-10P-10P equivalent
REMOTE RET CONTROL (6P FEMALE)	1-560-078-00 Plug, 6P Male or HIROSE HR10-7PA-6P equivalent
SCRIPT (4P FEMALE)	1-566-425-11 Plug, 4P Male or HIROSE HR10A-7P-4P equivalent
REMOTE (8P FEMALE)	1-766-848-11 Plug, 8P Male or CCA cable assembly (option) CCA-5-10 (10m)/CCA-5-3 (3m)
INCOM (5P FEMALE)	1-508-370-11 XLR, 5P Male or CANNON XLR-5-12C equivalent
MIC IN (3P FEMALE)	1-508-084-00 XLR, 3P Male or CANNON XLR-3-12C equivalent
AC OUT (for BVP-500P)	1-564-093-11 Plug, AC Outlet or HIRAKAWA HEWTECH CM-29 equivalent

1-2-3. Wiring Diagram for Cable

CCA-5 Cable



1-3. Outside Dimentions



(Unit : mm)

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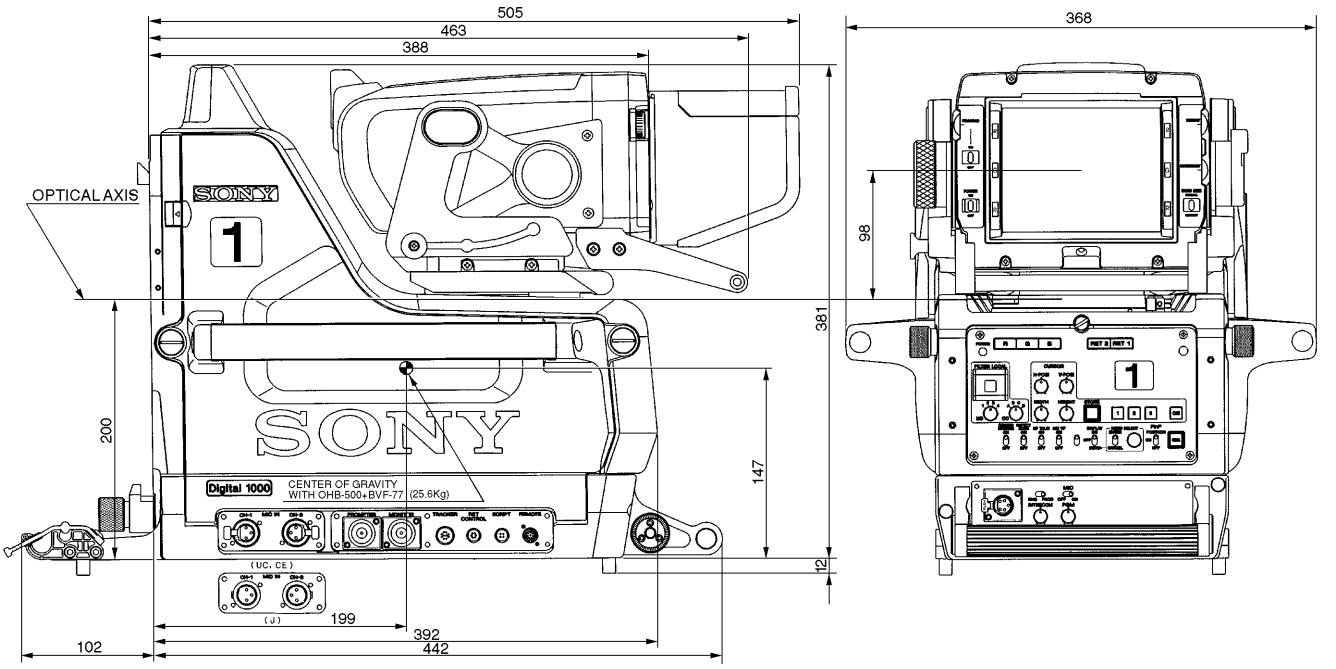
With BVF-77/77CE attached



(Unit : mm)

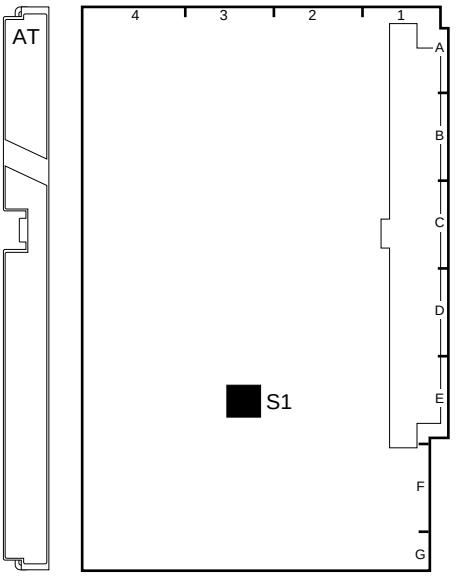
1-4. Installaton Conditions

Operating Temparature : –20 °C to +45 °C
Storage Temparature : –20 °C to +50 °C
Humidity : No condense

- Install the unit in a location as dry and well-ventilated as possible.
- Do not install the unit in the following conditions.
  High temparature room or near the heat source
  Excessive dust or mechanical vibration
  Intense magnetic and electric fields
  A place subjected to direct sunlight or strong light

1-5. Function of Internal Switches/ Controls

AT-95 Board



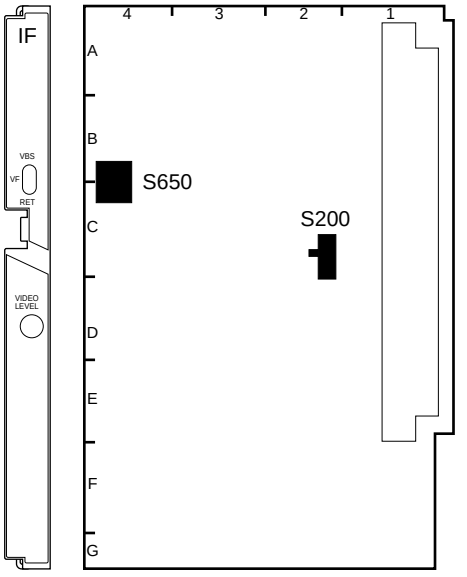
S1 : Setup menu select switch (S1-1 to S1-4)
Setup menu indicated on the viewfinder can be selected in combination of switches S1-1 to S1-4.

( ) in parentheses: Factory-set positions

				Setup Menu					
S1-1	S1-2	S1-3	S1-4	Operation	Paint	Maintenance	Reference	Triming	Config
OFF	OFF	OFF	OFF	YES	NO	NO	NO	NO	NO
(ON)	(OFF)	(OFF)	(OFF)	YES	YES	NO	NO	NO	NO
OFF	ON	OFF	OFF	YES	YES	YES	NO	NO	NO
ON	ON	OFF	OFF	YES	YES	YES	YES	NO	NO
OFF	OFF	ON	OFF	YES	YES	YES	YES	YES	NO
ON	OFF	ON	OFF	YES	YES	YES	YES	YES	YES

For details on the setup menu, refer to Section 3.

IF-538 Board



S200 : VF connector signal select switch
Selects an output signal to the viewfinder.

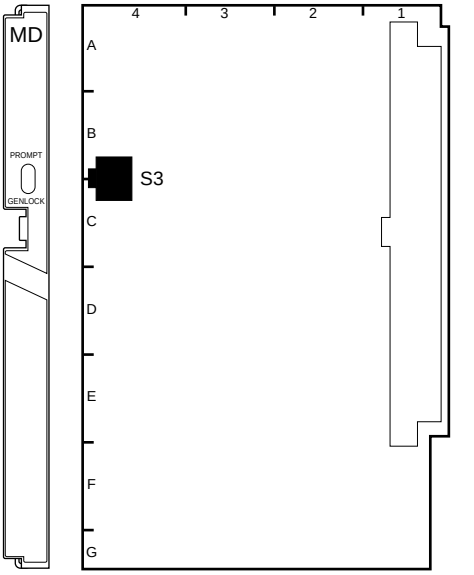
RET: Return video signal from CCU
GEN: Reference signal for external synchronization which is input at REF IN connector (of the BKP-5910/5910P)

Note

To output a reference signal, the standalone unit BKP-5910/5910P (available separately) is required.
Factory-set position: RET

S650 : MONITOR connector signal select switch
Selects an output signal at MONITOR connector.
VBS: VBS signal
VF: VF video signal
RET: Return video signal from CCU
Factory-set position: VBS

MD-103 Board



S3 : VBS GENLOCK IN/PROMPTER OUT select switch
Always set to PROMPT.

AU-211 Board

SW1 : INCOM MIC select switch
Select according to a microphone of the headset to be connected to INTERCOM connector.
C : Carbon microphone
D : Dynamic microphone
Factory-set position : C

SW2 : INCOM CONTROL MODE select switch (SW2-1 to 2-8)
SW2-1 : INCOM MIX switch
Turn on to add the intercom audio to the program audio.
Factory-set position : OFF

SW2-2 : INCOM/PGM MIX switch
Turn on to mix the program audio and the intercom audio in front of IC5 (EVR).
Factory-set position : OFF

SW2-3 : PGM MIX switch
Turn on to add the program audio to the intercom audio.
Factory-setting : OFF

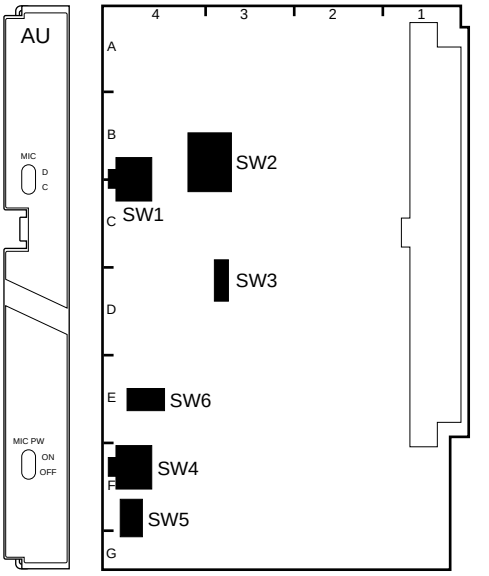
SW2-4 : PGM/INCOM level control mode select switch
ON : INCOM level control enables to adjust the levels of the intercom and program audios simultaneously, and PGM level control to adjust a mix ratio between the intercom and program audios.
OFF :INCOM level control adjusts the intercom audio level, and PGM level control adjusts program audio level.
Factory-set position : OFF

SW2-5 : SIDE TONE ON/OFF switch
Turn on to mix the side tone signal. (Mixing level: –26 dB)
RV3/AU-211 board adjusts the side tone level.
Factory-set position: ON

SW2-6 : Not used
Factory-set position : OFF

SW2-7 : PGM ON/OFF switch
Always set to OFF.

SW2-8 : PB AUDIO ON/OFF switch
Always set to OFF.



SW-3 : TALLY CONTROL switch (SW3-1, 3-2)
SW3-1 : BATTERY ALARM ON/OFF switch
Turn on to output a battery alarm signal to LENS TALLY lamp.
Factory-set position : OFF

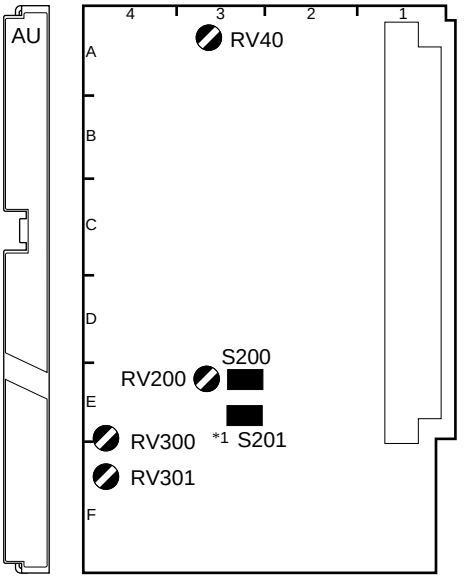
SW3-2 : POWER SAVE switch.
Always set to ON.

SW4 : MIC POWER ON/OFF switch
Turn on to use a microphone which operates with an external power supply system.
Factory-set position : OFF

SW5 : AB/PHANTOM MIC select switch
Select according to a microphone which operates with an external power supply system to be used.
AB : AB POWERING +12 V microphone
PHANTOM : PHANTOM +48 V microphone
Factry-set position : PHANTOM

SW6 : MIC LINE select switch
Selects a signal to be transmitted to MIC1 line.
MIC1 : MIC signal input at MIC CH-1 connector
MIC2 : MIC signal input at MIC CH-2 connector
Factory-set position : MIC 1

AU-215 Board



S200 : TRACKER TALK LEVEL select switch
Selects the MIC input level at TRACKER connector, 0 dBu or –20 dBu.
(0 dBu = 0.775 Vrms)
RV200/AU-215 board adjusts the tracker level.
Factory-set position: 0 dBu

S201 : MIC MONITOR ON/OFF switch[*1]
Turn on to add the program MIC input to the INCOM out of the INTERCOM connector and to monitor.
Factory-set position: OFF

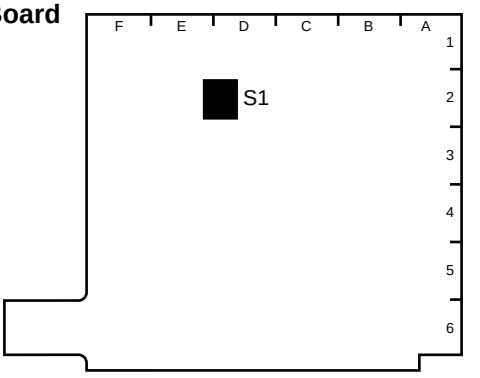
RV40 : RTS 1 CANCEL
Adjusts the side tone level for customer's preference.
Factory-set position: Minimized

RV300 : UP TALLY BRIGHT
Adjusts the intensity of the UP TALLY lamp for customer's preference.
Factory-set position: Maximized

RV301 : VF TALLY BRIGHT
Adjusts the intensity of the VF TALLY lamp for customer's preference.
Factory-set position: Maximized

[*1] : Serial No. 10091 and higher (UC)
40126 and higher (CE)

DM-98 Board



S1 : RET OUT select switch (S1-1 to S1-4)
S1-1 to S1-4 select an output signal to the viewfinder.

S1-1 : Disables automatically switching between PB VIDEO and RET VIDEO.

ON : Playback video signal
OFF : Return video signal (in connection with CCU)
Playback video signal (with the BKP-5910/5910P incorporated).

Note

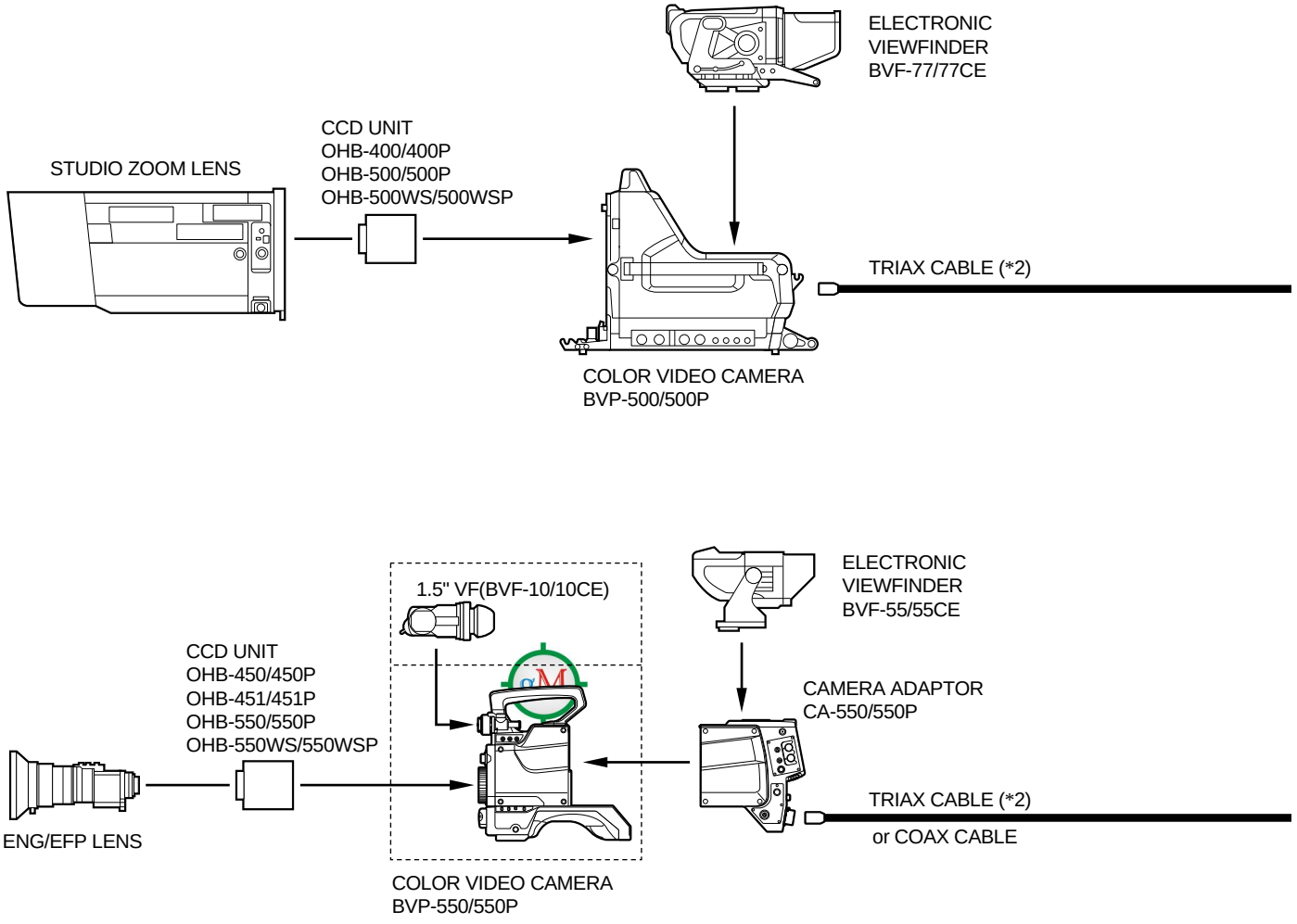
To output a playback video signal, the standalone unit BKP-5910/5910P (available separately) is required.
Factory-set position : OFF

S1-2 : Disables automatically switching between VBS/MONITOR and PB/RET.
Always set to OFF.

S1-3 : Selects VBS or MONITOR.
Always set to OFF.

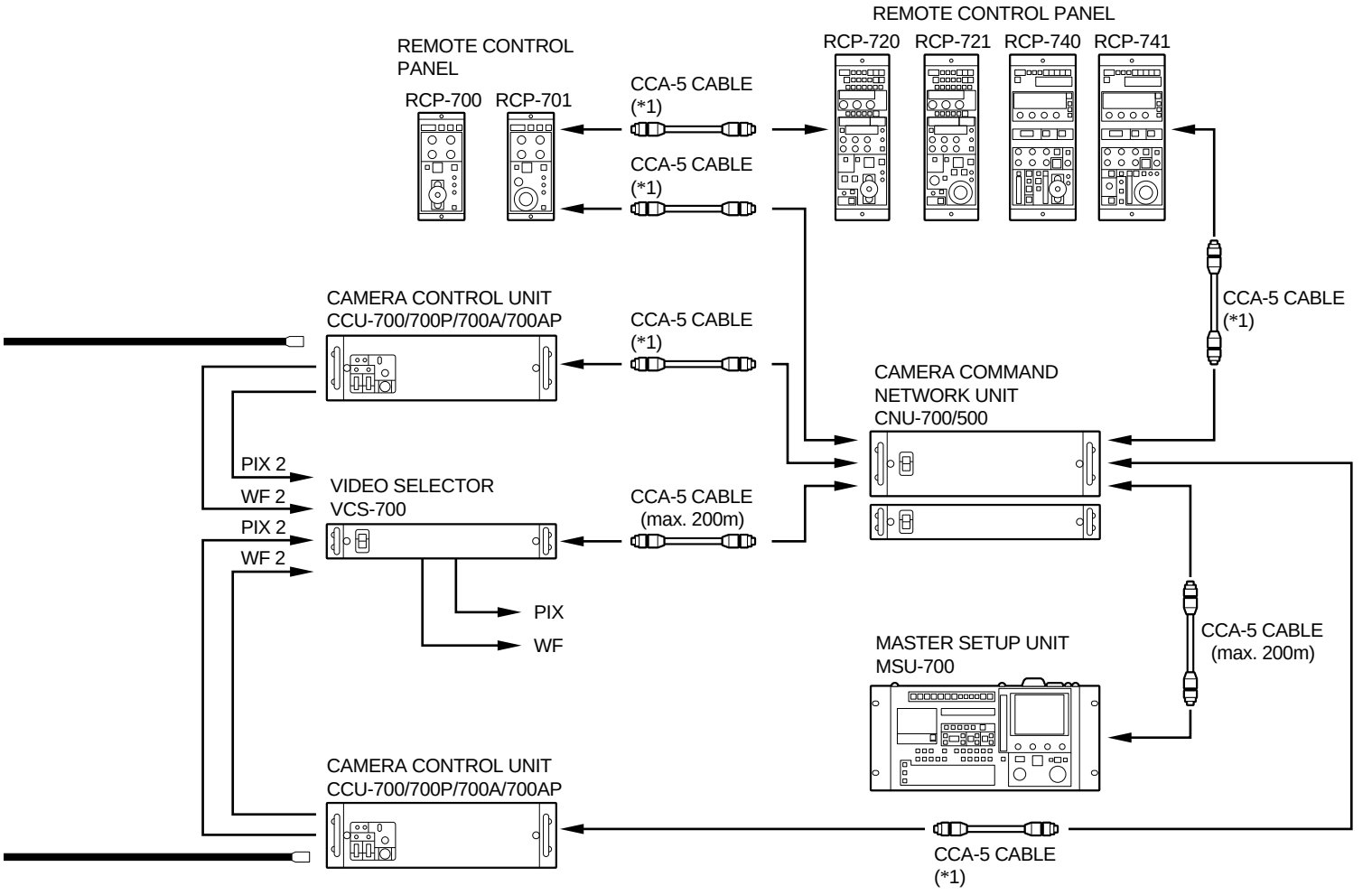
S1-4 : Inhibits RET CONT signal with S1-4 set to OFF.
Always set to ON.

1-6. Instance of Sytem Configuration

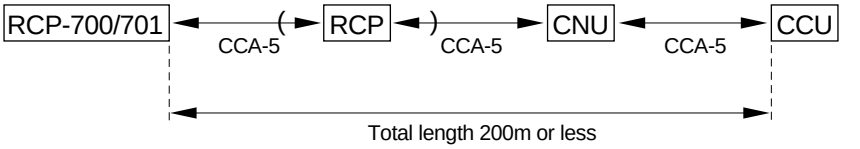


OTHER OPTIONAL ACCESSORIES

For BVP-500/500P	STANDALONE UNIT BKP-5910/5910P
	SCRIPT HOLDER BKP-7911/7912
For BVP-550/550P	ELECTRET CONDENSER MICROPHONE ECM-MS5
	MICROPHONE C-74 (Sony P/N 1-542-099-11)
	CRADLE SUSPENSION CRS-3P
	CARRYING CASE LC-303SFT
For CA-550/550P	TELEPROMPTER UNIT BKP-5971



*1: CCA-5 CABLE LENGTH



*2: TRIAX CABLE LENGTH

Diameter	Maximum length
8.5 mm	1000 m
14.5 mm	2000 m

Section 2
Service Overview

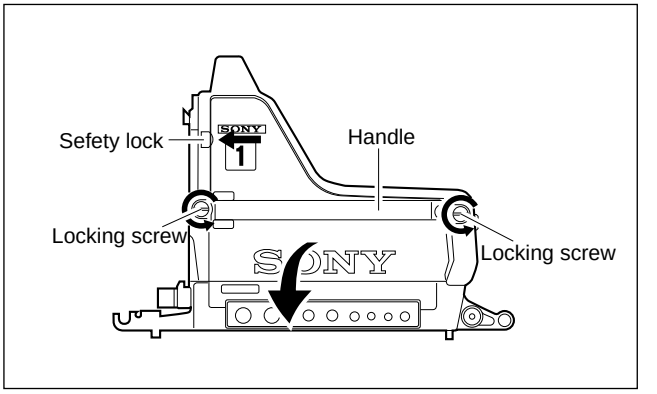
2-1. Opening and Closing the Side Panel

Opening

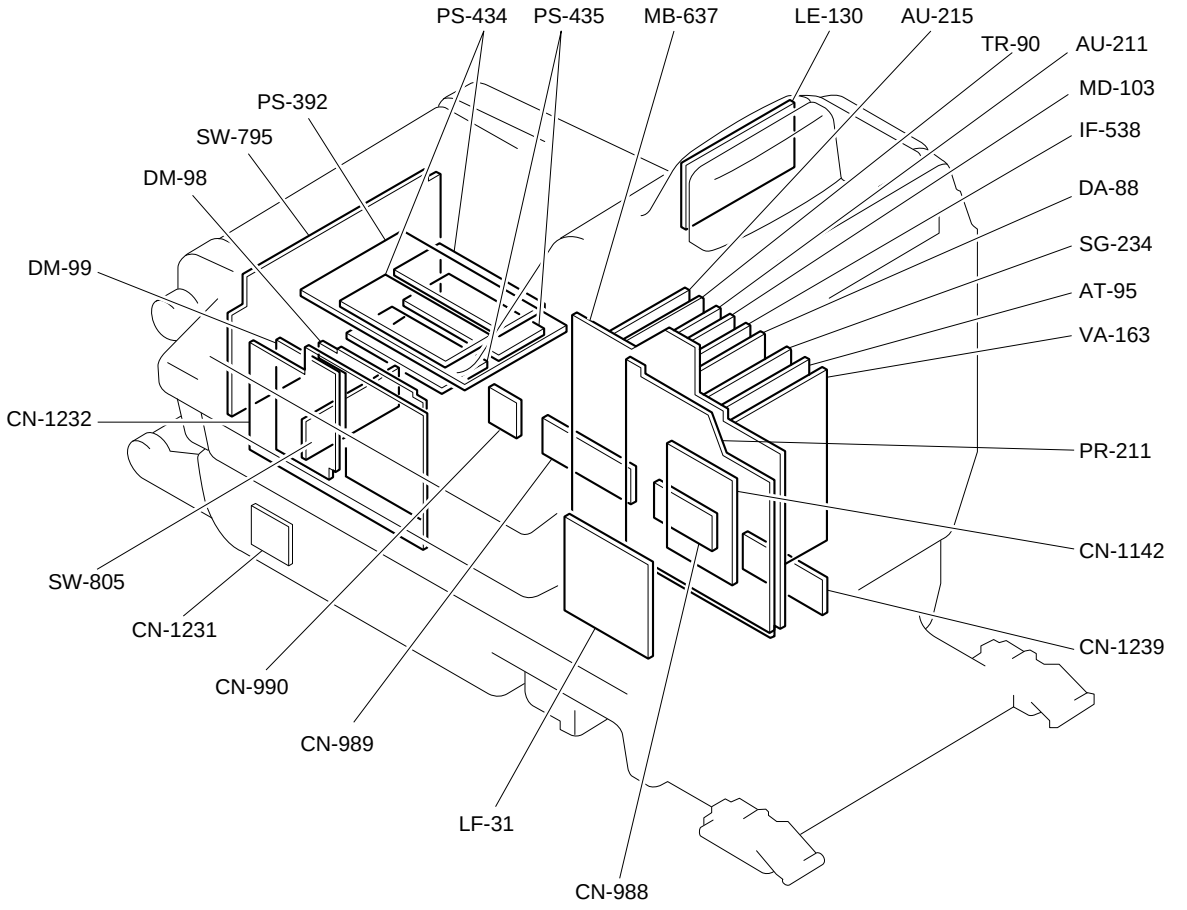
Loosen the two side-panel locking screws, and while sliding the safety lock toward the lens, open the side panel by holding the handle.

Closing

When you close the side panel, the safety lock is automatically locked. Fasten the side-panel locking screws securely.



2-2. Location of Printed Circuit Boards



2-3. Circuit Description

Circuit description for the BVP-500/500P and CCD unit OHB-400/500/500WS series (available separately) is described here. The BVP-500/500P is called as BVP, and OHB-400/500/500WS series is called as OHB in this section.

(1) CCD Drive System (OHB)

TG-159 board

The TG-159 outputs the pulses for driving the CCD to the DR-271 board and outputs the pulses for sampling the CCD output to the PA-181 board.
The driving pulses are synchronized with the HD and VD pulses input from the BVP and are output.
Pulses are generated from the VCO clock (36 MHz) of the board. The clocks for the digital processing circuit (36 MHz, 18 MHz)are also output to the BVP.
CCD V-sub voltage, white shading data and so on are also stored in the EEPROM of the TG-159 board.

DR-271 board

The DR-271 board converts the pulses from the TG-159 board to directly drive the CCD. The converted pulses are transmitted to the CCD via the BI-91(R)/91(G)/91(B) board respectively. The board also has a circuit which makes +29 V from +15 V for the V-sub voltage. Furthermore, the board also has an interface circuit for the optical filter.

BI-91(R)/91(G)/91(B) boards

The CCD is mounted on the BI-91(R)/91(G) /91(B) board respectivly. These boards supply the driving pulses and control voltages to the CCD.
The signals output from the CCD are sent to the PA-181 board via the source follower.

PA-181 board

The PA-181 board extracts video signals from the CCD signals output from the BI-91(R) /91(G)/91(B) boards by a correlated double sampling circuit, and amplifies the R and G signals by one time, and the B signal by three times.
The resultant signals are output to the VA-163 board of the BVP.

DR-302 board (OHB-400/400P only)

The DR-302 is a driving board for one optical filter disk, which motor-drives a filter selected by the RCP or MSU. The DR-302 board consists of a motor-drive circuit, and a servo circuit comprised of a selected-filter detection and filter position voltage generation circuits.

DR-306 board (OHB-500/500P/500WS/500WSP)

The DR-306 is a driving board for two optical filter disks. The main function is almost the same as the DR-302 board. However, the DR-306 board is provided with the shortest-turn function, which automatically selects the shortest-turn according to a selection of optical filter using a microcomputer.

(2) Video Signal System

VA-163 board

The VA-163 board amplifies the video signals output from the OHB and performs the following processings:
- Black shading correction
- Gain-up control
- Blanking cleaning
- White shading correction
- Feedback clamping
- White balancing
- Flare compensation, and
- Pre-knee

In addition, it also switches between the video signals, TEST SAW(TEST1) signal and 3-STEP TEST(TEST2) signal.

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PR-211 board

The PR-211 board converts the analog R, G, and B video signals into digital signals with an analog-to digital converter having sampling/holding functions.
It generates clocks required for the analog-to-digital conversion and the digital processings from the clocks generated by the OHB.
In addition, the PR-211 board adds a linear matrix and detail signals to the analog-to-digital converted R, G and B signals.
It performs the processings such as pedestal control, gamma correction, knee correction and white clipping for the signals. It also performs the followings.

- Generates an internal color-bar signal and switches between this signal and the main line signals.
- Creates detail and aperture signals from digital R and G signals.
- Creates a skin tone singal.
- Detects signals for an auto iris, flare compensation, DCC, and auto white/black balancings.
- Detects black/white shadings, generates a waveform to compensate them and outputs the wavefoem to the VA-163 board.
- Detects black levels and outputs the feedback clamp voltage to the VA-163 board.
- Generates TEST SAW waveforms and outputs them to the VA-163 board.

The video signals that has thus been digital-processed, are then converted to the Y, R-Y and B-Y signals and are output to the DA-88 board. The Y/C signals are generated from the Y, R-Y and B-Y signals with a color encoder IC on the PR-211 board. These signals, that were sampled at 36-MHz rate and quantized by 10 bits, are digital-to-analog converted.
And the resultants are then output to the DA-88 board as a monochrome signal for VF, wide-band luminance signal, or modulated chroma signal. The monochrome signal for VF has a zebra signal for level indication, and character signal and center marker signal mixed on it.

DA-88 board

The monochrome signal for VF (VF Y) sent from the PR-211 board goes through a lowpass filter and is output to the IF-538 board. The wide-band luminance signal Hi-Ys is output via a lowpass filter to the MD-103 board. The modulated chroma signal C goes through a black clamp circuit and lowpass filter and is added to the Hi-Ys. The resultant is output to the IF-538 board as a VBS signal.
The Y, R-Y and B-Y signals, that are input from the PR-211 board as the digital video signals, are aligned in phase with video signals in another channels by a digital delay line. The resultant is digital-to-analog converted and is then output via a lowpass filter and black clamp circuit to the IF-538 board. On the other hand, an analog component signal is generated in combination with the above-mentioned Hi-Ys signal, R-Y and B-Y signals. The analog component signal is controlled, on the level adjustment and reference signal addition, by the AT-95 board according to equipment connected to the camera (VTR or CCU). The analog component signal is output to the MD-103 board via the MB-637 board.

IF-538 board

Input signals at the IF-538 board are as follows;
Signals from the DA-88 board: VF Y, VBS, Y, R-Y and B-Y
Signals from external equipment: Reference signal for external synchronization, Return video signal
By combination with these signals, the IF-538 board outputs the following signals.

- VTR VBS OUT signal
  The input VBS signal is output via the buffer amplifier to the MB-637 board. This is used to output for the VTR connector (26P) of the standalone unit BKP-5910/5910P only when the standalone unit is installed in the camera.

- VF OUT signal
  Switching between the return video or reference signal which is selected with S200/IF-538 board, and the VF-Y singal is done by the $\overline{\text{CAM}}$/RET signal. The selected signal is via a lowpass filter to the PinP (Picture in Picture) circuit to be processed as a small picture signal. At the next stage, an analog switch switches back and forth between the large and small picture signals to display the small picture in the large picture. In combination with this analog switch and another analog switch at the front of the PinP circuit, reversing between the large and small picture signals, and moving the position of the small picture are allowed by operating the rear panel switch. At the final stage, thus picture-in-picture signal has center marker and safety zone pulse signals mixed on it and is output at the IF-538 board.
- MONITOR OUT signal
  The S650/IF-538 board selects a signal from VF signal, VBS signal or one of the return video or reference signal selected with S200/IF-538 board. The selected signal is output via the amplifier at the MONITOR OUT connector on the side of the camera. When the VF signal is selected, however, it is switched over to the VF-Y or RET signal by the $\overline{\text{CAM}}$/RET signal corresponding the VF display selection.

In addition, the IF-538 board is equipped with the following circuits.

- HD/VD external sync circuit
  When displaying the return video or reference signal on the viewfinder screen, it is necessary to synchronize the cursor signal with those signals. And a sync signal is separated from those signals to generate the external HD and VD signals, and the resultant is sent to the cursor signal generation circuit on the PR-211 board.
- Peak-detects the G signal and outputs to the AT-95 board.
- Transmits the SKIN GATE signal from DA-88 board to the MD-103 board.

(3) Auto system

AT-95 board

The AT-95 board consists of a microcomputer which controls the camera according to the instructions stored in a ROM. Operations of the board are listed below;

- Analyzes video system detection data, analog data and instructions of the function switches.
- Outputs various control signals and compensation signals to the boards.
- Outputs status information and self-diagnosis information as character data from the character generator.
- Incorporates the interface function with the RM-P9 or the CCU-700/700P.

(4) Pulse system

SG-234 board

The SG-234 board has a sync signal generator which generates various sync signals for the camera. The sync signals are generated from the clock pulse input from the OHB via the PR-211 board. They are output to the boards of the camera and OHB respectively. This generator has two modes to synchronize with a reference signal input for external synchronization. One is a VBS input mode when the camera is used together with the standalone unit BKP-5910/5910P and the other is a V RESET/H CONT mode when the CCU is connected to the camera.

(5) Audio modulation/demodulation system

AU-211 board

The CHU/RCP data is input/output from/to the AU-211 board. And audio signal processings such as the audio mode switching and gain control of MIC CH-1 and CH-2 are performed.
The received data from the RCP goes through the photocoupler and is then send as the COM CONT signal to control the camera, to the AT-95 board. If the CCU is connected to the unit, the COM CONT signal is automatically send to the CCU. As for how to select the INCOM mode, refer to Section 1-5 “Function of Internal Switches – AU-211 board”. In addition, the AU-211 board supplies the power to the MIC CH-2 connector.

TR-90 board

The TR-90 board modulates/demodulates the audio signals such as the MIC, INCOM and PGM. It also demodulates the H CONT signal and modulates/demodulates the CHU/CCU DATA. And it also generates the TONE signal and modulates it.

AU-215 board

The AU-215 board controls/drives a tally system circuit and also supplies the power to the MIC CH-1 connector. It also mixes the TRACKER TALK signal and the intercom audio and outputs the intercom audio as the TRACKER RECEIVE.

(6) Video modulation/demodulation system

MD-103 board

The MD-103 board modulates the luminance signal Y, the color difference signals R-Y and B-Y. And it selects a signal to be input/output at GENLOCK IN/PROMPT OUT connector. But, this selection is invalid for this camera and the S3/MD-103 board does not activate. And also it quadrature-modulates the Y signal and SKIN GATE signal with the carrier of 22.5 MHz. The resultant signal is sent to the CCU.

DM-98 board

The DM-98 board demodulates the RET VIDEO signal and also selects an output signal. The relationships between the switch setting and output signal are given in Section 1-5 “Function of Internal Switches – DM-98 board”.

DM-99 board

The DM-99 board demodulates and amplifies the PROMPT signal.

2-4. Description of EEPROM Data

The table below gives the holding data of EEPROM on every printed circuit board.

Board	Ref. No.	Holding data
VA-163	IC26	VA-163 adjustment data
AT-95	IC46	Triming/Reference files
SG-234	IC21	SG-234 adjustment data
DA-88	IC10	DA-88 adjustment data
IF-538	IC603	IF-538 adjustment data
MB-637	IC5	Model name, Serial number of the unit

Note

The IC listed above cannot be replaced because it is the EEPROM that is holding data inherent in the board. The part number listed in Section 1 “Spare Parts” of BVP-500/500P Maintenance manual, Volume 2 is for an EEPROM which is not programmed. If replacement is needed, consult your Sony representatives.

2-5. Disconnecting/Connecting Flexible Card Wire

The flexible card wires are used between the MB-637 and CCD unit(OHB), MB-637 and SW-795 boards and MB-637 and PR-211 board respectively. Take care not to break these flexible card wires. This shorten the wire life.

Disconnecting

1. Turn off the power.

Type A

(between MB-637 and CCD unit, and between MB-637 and SW-795)

2. Lift up the portion A in the direciton of the arrow and disconnect the flexible card wire.

Type B

(between MB-637 and PR-211)

2. Slide portions B in the direciton of the arrow to unlock and pull out the flexible card wire.

Connecting

Notes

- Be careful not to insert the flexible card wire obliquely.
- Check that the conductive surface of the flexible card wire is not soiled with dust.

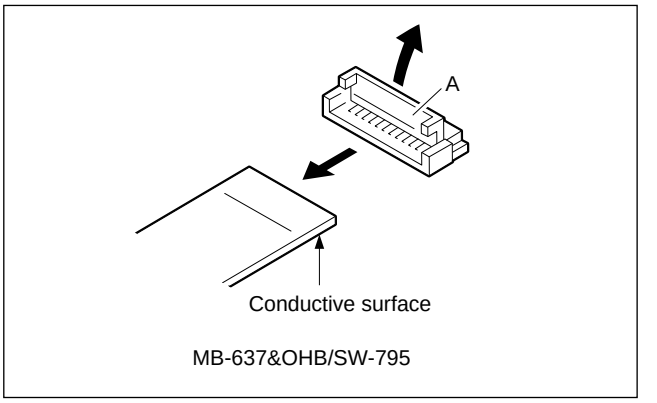
Type A

1. Lift up the portion A in the direction of the arrow and insert the flexible card wire as far as it will go with the conductive surface down.
2. Push down the portion A to secure the flexible card wire.

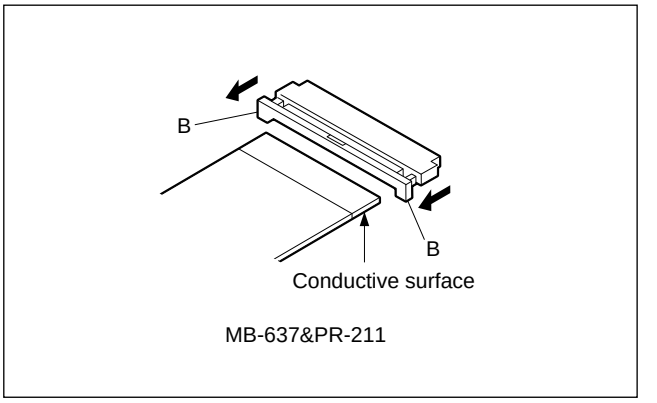
Type B

1. Slide portions B in the direction of the arrow and insert the flexible card wire as far as it will go with the conductive surface down.
2. Slide portions B in the reverse direction to lock.

Type A



Type B



2-6. Replacement of Board

2-6-1. Note on Replacement of Parts

Every electrical part mounted on the LF-31, PR-211 and CN-1142 boards cannot be replaced. If there is any defective part, replace the board itself.
The PR-211 board is provided with a termination board CN-1142 on it. The CN-1142 board is necessary when the PR-212 board of OHB-500WS/500WSP is not installed. Unless the PR-212 board is installed, be sure to connect the CN-1142 board to the PR-211 board.

2-6-2. Replacement of CN-988/989/990 Board

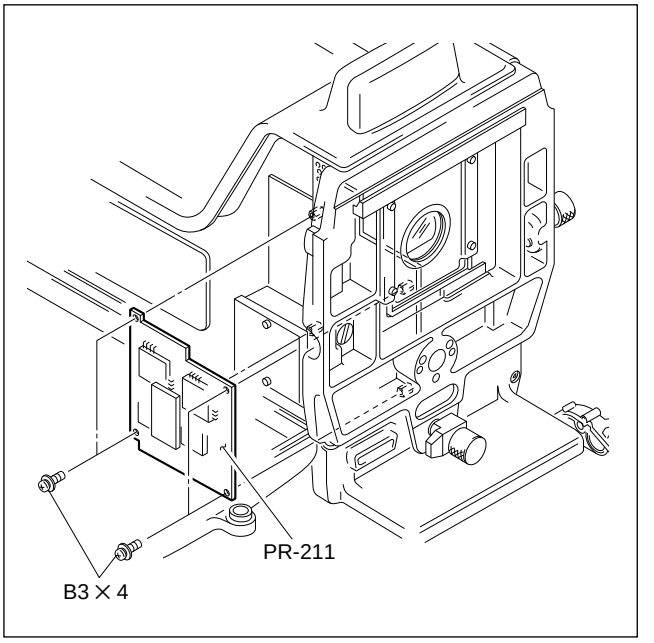
The CN-988/989/990 boards are small printed circuit boards used for the camera's right side panel equipped with the REMOTE connector and so on. If you order one of these boards, a combined board of the above three will be supplied from the Sony parts center. So, please cut off a necessary board from it and use for service.

2-6-3. Replacement of PR-211 Board

Note

In replacing the PR-211 board, a screwdriver whose blade is long (blade length: 200 mm or more) is required. (Sony P/N:7-700-739-01 or equivalent)

1. Open the left side panel referring to Section 2-1.
2. Remove the four screws to remove the PR-211 board.
3. Disconnect the flexible card wire referring to Section 2-5.

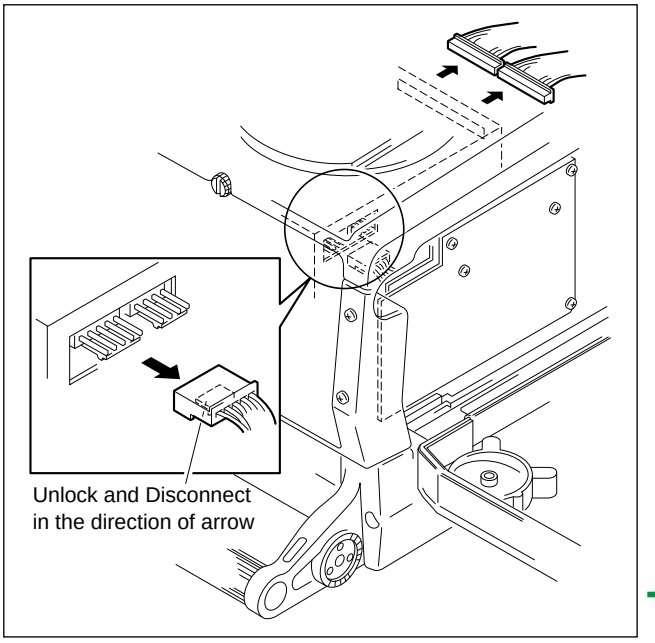


4. Install a new board in the reverse procedures of removal.

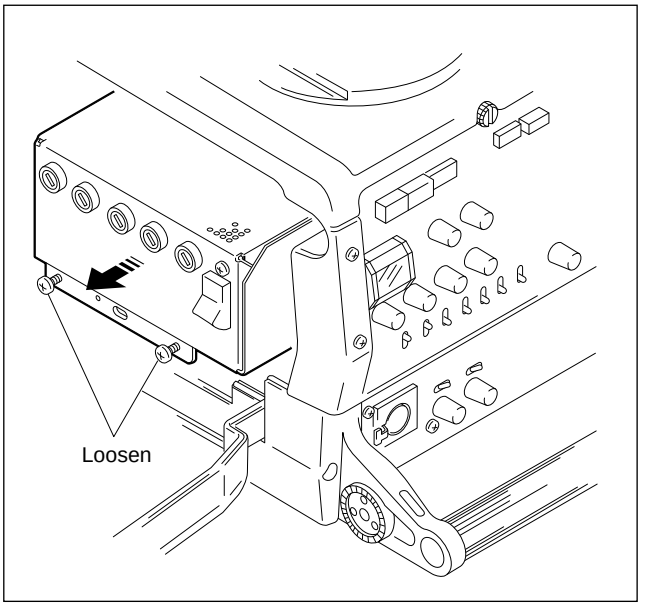
2-7. Replacement of Power Assembly

2-7-1. Replacement of Power Assembly

1. Open the both side panels referring to Section 2-1.
2. Disconnect the three connectors from the power assembly.



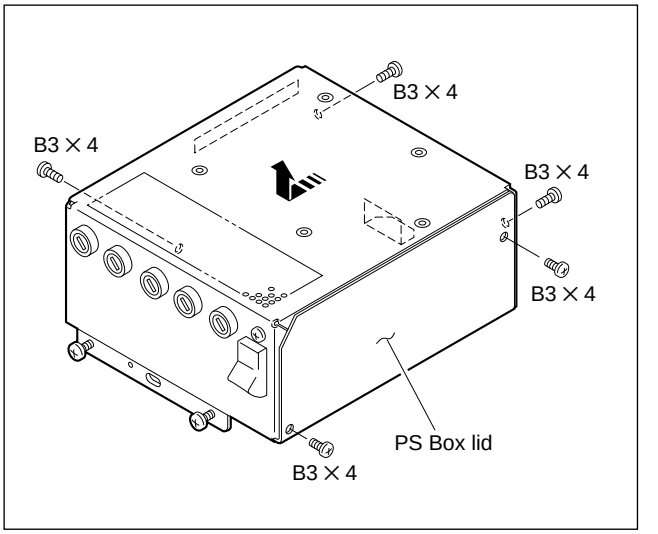
3. Loosen the two screws and pull out the power assembly.



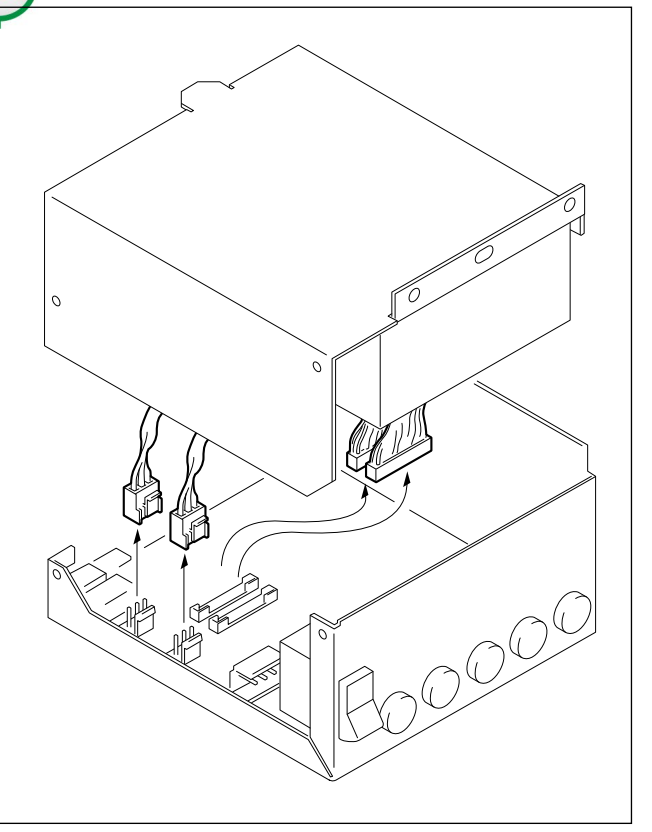
4. Install a new power assembly in the reverse procedures of removal.

2-7-2. Removal of PS-392 Board and AC.DC/DC Convertor

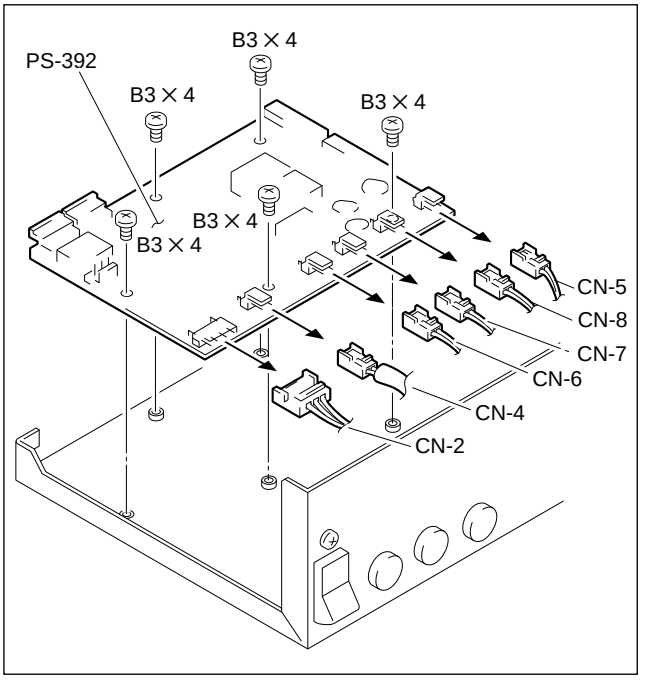
1. Remove the power assembly referring to Section 2-7-1.
2. Remove the five screws and remove the PS box lid.



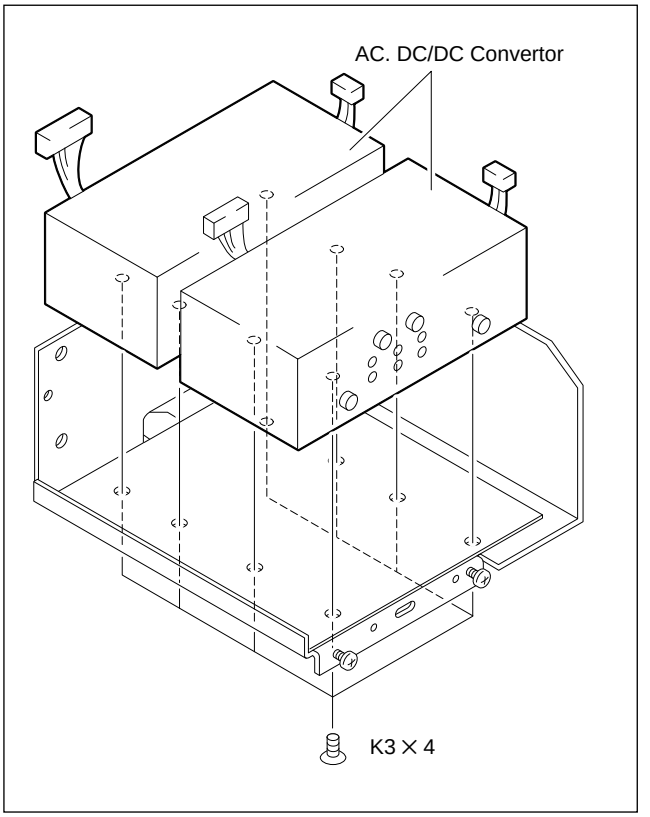
3. Disconnect the four connectors of the AC.DC/DC convertor from the PS-392 board.



4. To remove the PS-392 board, disconnect the six connectors and remove the five screws.



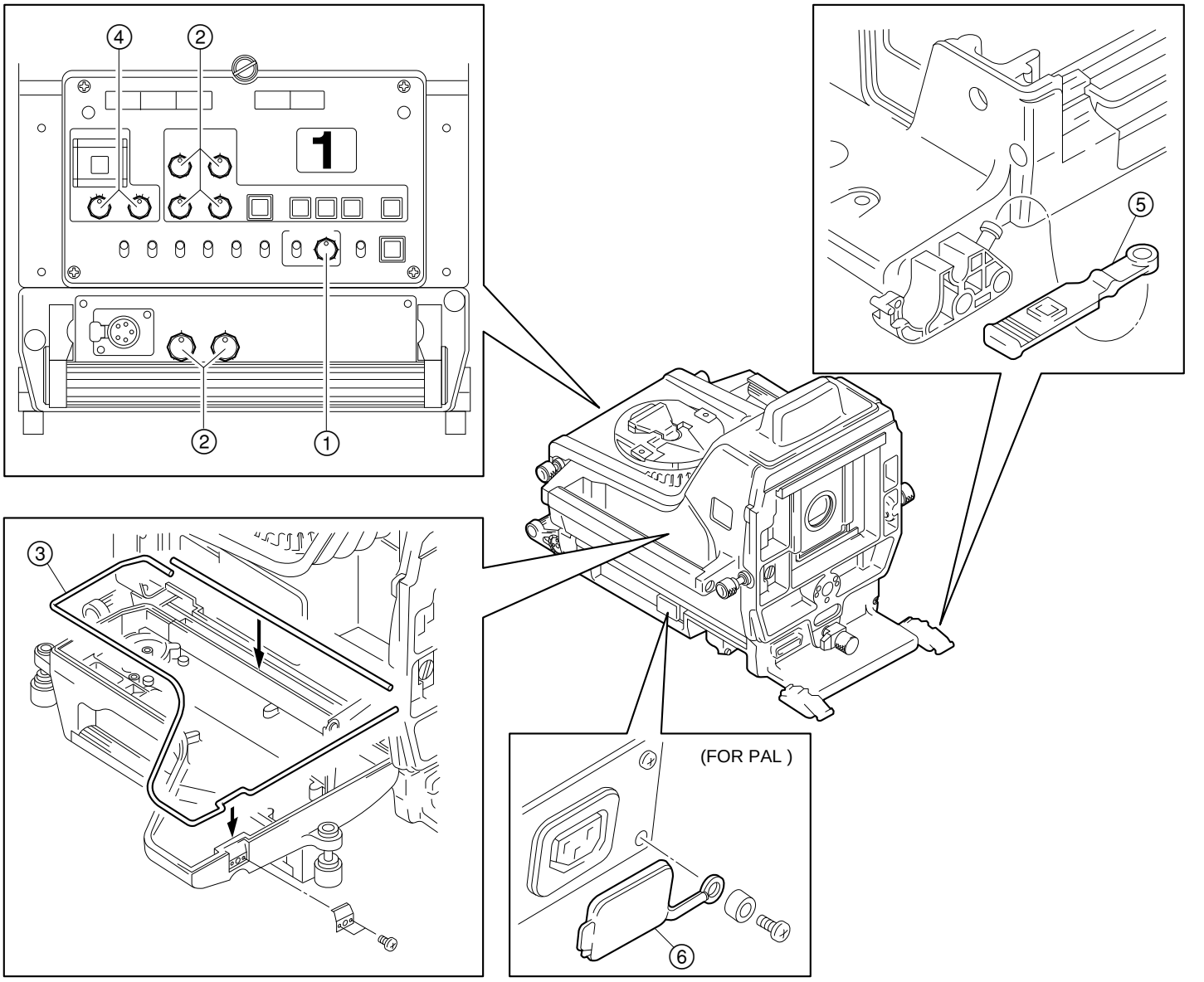
5. To remove the AC.DC/DC convertor, remove the four screws respectively.



2-8. Periodic Replacement Part

Parts listed below is a periodic replacement part. It is subject to cracks with the lapse of time. Check sometimes by visual, and replace as necessary.

No.	Description	Sony P/N
①	Control Knob Assembly	X-3167-051-X
②	Control Knob Assembly	X-3167-563-X
③	Shielding Rubber	3-185-869-2X
④	Control Knob	3-185-872-0X
⑤	Cable Clamper	3-186-502-0X
⑥	Outlet Lid (for PAL)	3-186-501-0X



2-9. Tools and Fixtures

2-9-1. Tools and Fixtures

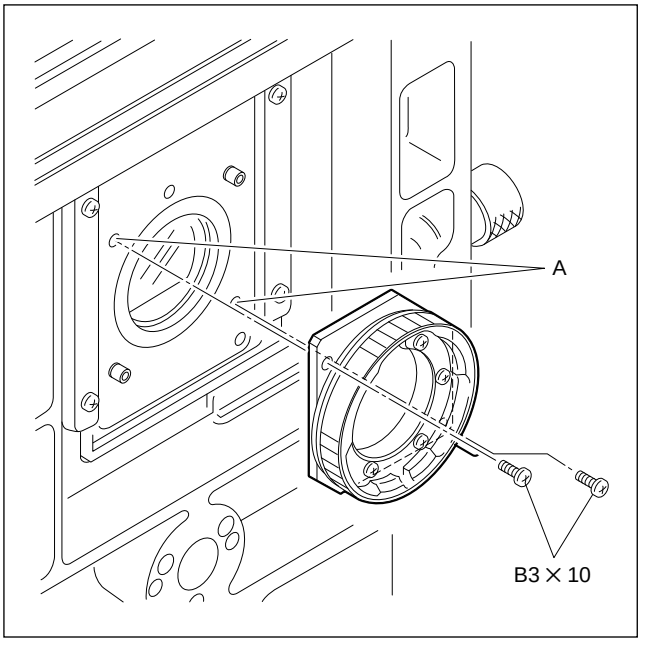
Description	Sony P/N
Extension Board EX-464	J-6395-040-A
Extension Cable for Power assembly	J-6395-070-A
Portable Lens Attachment (for OHB-400 series)	J-6395-080-A
Portable Lens Attachment (for OHB-500 series)	J-6395-090-A

2-9-2. Use of Portable Lens Attachment

Use of a portable lens attachment enables a portable lens to be attached to the camera. This attachment should be used for limited application such as adjustment. Because the characteristics of the camera are not satisfied when it is used for shooting.

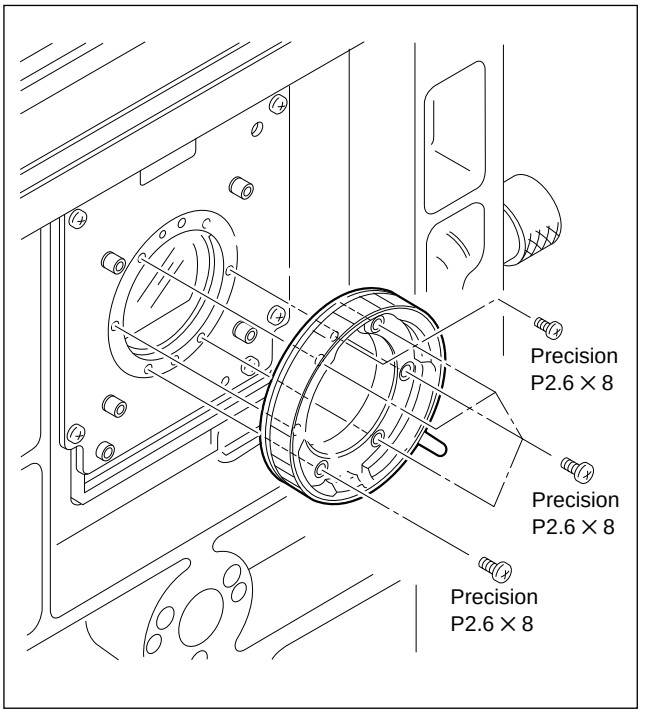
Attaching to OHB-400 series

Remove the two hexagon-socket bolts at portions A. Attach the portable lens attachment with two screws (B3x10).



Attaching to OHB-500 series

Attach the portable lens attachment with the six screws (precision P2.6x8) supplied with the attachment.



2-10. Notes on Repair Parts

1. WARNING

Safety Related Components Warning

Components marked ⚠ are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

2. Standardization of Parts

Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.
Parts list has the present standardized repair parts.

3. Stock of Parts

Parts marked with “o” at SP(Supply Code) column of the spare parts list may be not stocked. Therefore, the delivery date will be delayed.

4. Units Representation

The following represented units are changed or omitted in writing.

Units	Representation	
Capacitance	μF	uF
Inductance	μH	uH
Resistance	Ω	Abbreviation

5. Destination Representation

The part indicated “For J/UC/CE” in the spare parts list is used in the unit written below.

For J : The part is used in a unit for Japan.
For UC : The part is used in a unit for U.S.A. and Canada.
For CE : The part is used in a unit for regions except the above countries.

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Section 3
Setup Menu

3-1. Setup Menu

The Setup menu is used to select settings of camera operation, select items to be displayed on the viewfinder screen, and select the way the items are displayed.
It is also used for adjustment. The menu appears on the viewfinder screen.
By changing an internal switch on the IF-538 board, the same signal as output to the viewfinder is enabled to be output at the MONITOR connector.

• Configuration of the Setup Menu

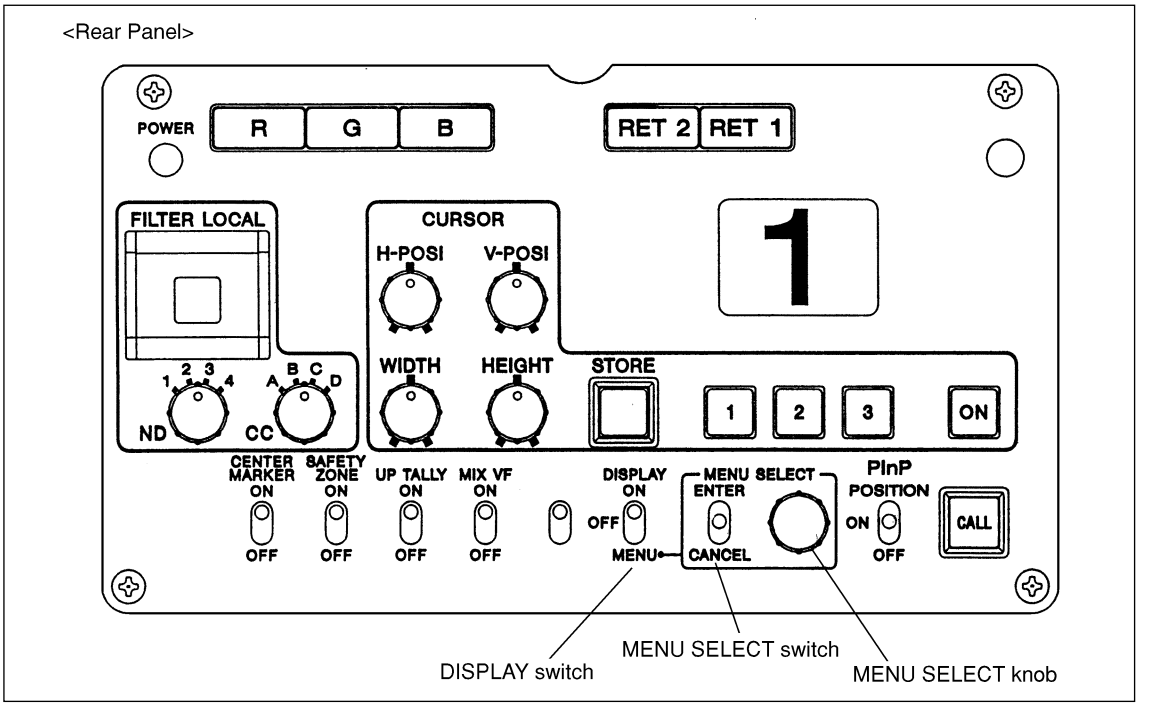
The setup menu consists of the following menus
- Operation menu
- Paint menu
- Maintenance menu
- Reference menu
- Triming menu
- System config menu

Operation and Paint menus are normally accessible. To display the other menus, switch setting of the AT-95 board is required. For details, refer to Section 1-5. “Function of Internal Switches—AT-95 board”

• Equipment required

CCD Unit	OHB-400/500 series
Camera Control Unit	CCU-700/700P/700A/700AP.
7-inch Electronic Viewfinder	BVF-77/77CE (or B/W monitor)

• Switches and Control knob



DISPLAY switch

ON : Displays characters and messages indicating the video camera settings and operation status.
OFF : No character or marker display appears on the viewfinder screen.
MENU : The setup menu appears on the viewfinder screen.

MENU SELECT knob

Selects the menu item or setting value displayed on the viewfinder screen.

MENU SELECT switch

ENTER : Enters the page/item select mode, or enters the setting values.
CANCEL : Cancels the contents of a menu setting, or returns to the page select mode or TOP menu.

Note

The TOP menu screen indicates the entire configuration of menu items.
To display the TOP menu, set the DISPLAY switch to MENU (from OFF) while pushing up the MENU SELECT switch to ENTER.

- **Basic Operation**

1. Displaying the menu
   To display the Operation menu, set the DISPLAY switch to MENU.
   To display the other menus than the Operation menu, first of all, the TOP menu shall be displayed.
   To display the TOP menu, set the DISPLAY switch to MENU while pushing up the MENU SELECT switch to ENTER. Then turn the MENU SELECT knob to move the cursor to a menu item which you want and push up the MENU SELECT switch to ENTER.
2. To shift the page, turn the MENU SELECT knob with a page scroll bar displayed at the top-right of the screen until the desired page is displayed and push up the MENU SELECT switch to ENTER. The menu enters the item select mode and the page scroll bar disappears.
3. To shift the item, turn the MENU SELECT knob until the → cursor points the item to be set and push up the MENU SELECT switch to ENTER.
4. To change the value, turn the MENU SELECT knob. You can change the values quickly by turning the MENU SELECT knob fast. You can make very fine adjustments by turning the switch slowly. By pushing up the MENU SELECT switch to ENTER, the setting is entered.
5 The menu page is returned to the item select mode or page select mode every time the MENU SELECT switch is pushed down to CANCEL.
6. To exit from the setup menu, set the DISPLAY switch to OFF.

- **ROM version**

Contents in the menu and factory settings may differ from the descriptions in this manual depending on the version of ROM (IC36) on the AT-95 board.
In this section, an item under “Ver.” in the table shows a ROM version. If any version is given, it shows that the function for the item is added or changed, and the ROM with that version or higher version supports the function. If no version is given, it shows that every ROM version supports the function.
To confirm the ROM version easily proceed as follows:

1. Set the DISP switch to OFF.
2. Power the unit on while pushing up the MENU SELECT switch to ENTER. The indication of ROM version is displayed for about three seconds.

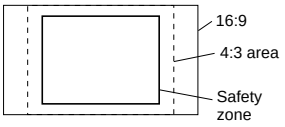
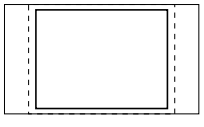
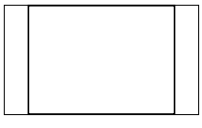
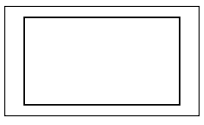
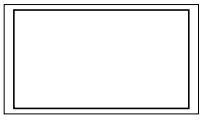
3-1-1. Operation Menu

This menu contains items contained for changing camera settings to suit shooting conditions during normal camera operations.

(Boxed items under “Settings” indicate the factory setting.)

Page	Ver.	Item	Settings	Contents
VF DISPLAY		ZOOM	[ON], OFF	Turns on and off the indications of zoom position and lens extender.
		SHUTTER	[ON], OFF	Turns on and off the indications of shutter speed and mode.
		IRIS	[ON], OFF	Turns the iris setting indication on and off.
		AUDIO	– –	Turns the audio level indication on and off. (Does not function in the unit.)
		TAPE	– –	Turns the tape-remaining indication on and off. (Does not function in the unit.)
		ZEBRA	ON, [OFF]	Turns the zebra indication on and off.
		MESSAGE	[ON], OFF	Turns on and off the indication of message in changing each setting of filter, white balance memory, gain value, DCC(auto knee) and shutter speed. The indication is displayed within three seconds in the center of the viewfinder screen.
		MODE	CHG, [USR]	CHG : The indications of the optical filter, white balance memory and gain value are displayed only when they differ from the standard settings (FILTER:1B, WHITE:A, GAIN:0dB) USR : The indications are displayed corresponding to the settings on the VF DISPLAY page.
		FILTER	*, [ON], OFF	Turns the optical filter indication on and off.
		WHITE	*, ON, [OFF]	Turns the white balance memory indication on and off. (Automatically turned OFF in connection with CCU/RCP.)
		GAIN	*, [ON], OFF	Turns the gain value indication on and off.
MARKER		CENTER	[ON], OFF	Turns the center marker indication on and off.
		SAFETY ZONE	80%, [90%], OFF	Turns the safety zone marker indication on and off and selects the area indicated by that marker.[a)]
		BOX CURSOR	ON, [OFF]	Turns the box cursor indication on and off.
		BOX H POS	-99 to 99 ([0])	Shifts horizontally the location of the box cursor on the screen.
		BOX V POS	-99 to 99 ([0])	Shifts vertically the location of the box cursor on the screen.
		BOX WIDTH	00 to 99 ([41])	Sets the width of the box cursor.
		BOX HEIGHT	00 to 99 ([10])	Sets the height of the box cursor.

a) In the 16:9 mode, the following kinds of safety zone marker can be selected in combination of the settings of “SAFETY ZONE” and “4:3 SAFETY”.

		SAFETY ZONE		
		80%	90%	OFF
4:3 SAFETY	ON			
	OFF			Not indicated

Page	Ver.	Item	Settings	Contents
GAIN SW		LOW	-3, [0], 3, 6, 9, 12, 18, 24, 30 dB	Selects the gain value for each gain switch position (LOW, MIDDLE, HIGH) of RM-P9 when the standalone unit is installed in the unit. (Note: Except under the above conditions, the setting change becomes invalid.)
		MID	-3, 0, 3, 6, [9], 12, 18, 24, 30dB	
		HIGH	-3, 0, 3, 6, 9, 12, [18], 24, 30dB	
WIDE SCREEN (For OHB-500WS /500WSP)		16:9/4:3 MODE	[16:9], 4:3	Selects the aspect ratio for the video signal output. (This setting is valid only when the standalone unit BKP-5910/5910P is incorporated.) b)
		VF ASPECT	[AUTO], 4:3	Selects the aspect ratio for the viewfinder indication. AUTO : Automatically selects according to the aspect ratio selected by16:9/4:3 MODE on the WIDE SCREEN page. 4:3 : Selects 4:3 regardless of the 16:9/4:3 MODE setting.
		4:3 SAFETY	ON, [OFF]	Selects whether the safety zone maker showing the 4:3 area is indicated in the 16:9 mode, or not. a)
		16:9 ID ON VF	ON, [OFF]	Turns on and off the 16:9 indication in the 16:9 mode on the viewfinder screen. (This setting is valid only when the DISPLAY switch is set to on or off.)
		16:9 ID	ON, [OFF]	Selects whether the 16:9 indication is displayed on the internal color-bar in ON BARS the16:9 mode, or not. (This setting is valid only when the DISPLAY switch is set to on or off.)
MON OUT		BNC TEST OUT	– –	Does not function in the unit. The panel switch (S650) on IF-538 board can select a signal to be output at MONITOR connector (VBS, VF or RET)
		RM/MON CHAR	[ON], OFF	Selects whether character signals displayed on the viewfinder screen are mixed with the VBS signal when “VBS” is selected by the panel switch (S650) on IF-538 board.
		VBS LOCK	– –	Does not function in the unit.
		VF VIDEO MODE	[Y], MIX, NAM	Selects a video signal to be output to the viewfinder. Y : Y=0.3R+0.59G+0.11B; The same as a camera output signal MIX : Y=0.33R+0.33G+0.33B NAM: Selects one of the R, G, and B signal that is maximum in level.
		[RGB]-G	ON, [OFF]	Sets signals selectable by RGB switch. ON : R-G, B-G OFF : R, G, B
AUTO IRIS AUTO KNEE (DCC)		IRIS OVERRIDE	-99 to 99 ([0])	Sets the reference value for automatic iris adjustment. -99 (further closed) ↔ 99 (further opened)
		IRIS OVERRIDE	ON, [OFF]	Turns the auto-iris override function on and off.
		APL RATIO	-99 to 99 ([0])	Sets the way the iris is automatically adjusted. 99 (PEAK) ↔ 99 (AVERAGE)
		AUTO KNEE POINT	-99 to 99 ([XX])	Sets the point on which the knee function starts to have effect in the auto-knee mode.
		AUTO KNEE	-99 to 99 ([XX])	Sets the volume of the effect of the knee function in the auto-knee mode.SLOPE

b) The change of aspect ratio using this menu is disabled because the CCU’ s setting has a priority when the CCU is connected. If you want to change the aspect ratio when the CCU is connected, use the OTHERS page of the Paint menu. When you attempt to change using this menu, a message “Use Paint MNU” is displayed.

Page	Ver.	Item	Settings	Contents
STAND ALONE		H PHASE	-99 to 99 (XX)	Sets the horizontal phase of the camera in the genlock mode.
		SC PHASE	0 to 360(XX)	Sets the subcarrier phase of the camera in the genlock mode.
		CABLE COMP	ON, OFF	Turns on and off the cable compensation circuit for the external sync signal in the genlock mode.
		SNG BARS	ON, OFF	Turns the color-bar signal for SNG on and off.
		MASTER BLACK	-99 to 99 (0)	Adjusts the MASTER BLACK level.
		IRIS OVERRIDE	ON, OFF	Turns the auto-iris override function on and off.
		CF PULSE	ON, OFF	Turns on and off the color framing pulse supplied to the VTR.
		SKIN DETAIL	ON, OFF	Turns the skin tone detail function on and off.
	1.10	AUTO HUE	Throw MENU SELECT switch to ENTER to execute.	Sets the skin detail hue function automatically. (Locate the desired skin color within the gate marker of VF and measure.)
AUTO SETUP		AUTO BLACK	Throw MENU SELECT switch to ENTER to execute.	Starts to automatically adjust the black balance. (To abort a processing during execution, throw MENU SELECT switch to ENTER.)
		AUTO WHITE	Throw MENU SELECT switch to ENTER to execute.	Starts to automatically adjust the white balance.
		LEVEL AUTO	Throw MENU SELECT switch to ENTER to execute.	Starts to automatically adjust the level in the internal circuits. c) (To abort a processing during execution, throw MENU SELECT switch to ENTER.)
		TEST	1, 2, OFF	Selects the test signal. 1 : Outputs the sawtooth waveform test signal 2 : Outputs 3-step waveform test signal OFF : No test signal is output.
DIAGNOSIS		OHB	OK, NG	Displays a state of communication for control data between the OHB block and CPU on AT board.
		PR	OK, NG	Displays a state of communication for control data between the PR board and CPU on AT board.
		VA	OK, NG	Displays a state of communication for control data between the VA board and CPU on AT board.
		AT	OK, NG	Displays a state of communication for control data between the CPU and memory on AT board.
		SG	OK, NG	Displays a state of communication for control data between the SG board and CPU on AT board.
		DA	OK, NG	Displays a state of communication for control data between DA board and CPU on AT board.
		IF	OK, NG	Displays a state of communication for control data between IF board and CPU on AT board.
		MD	OK, NG	Displays a self-diagnosis result of MD board in connection with CCU.
		AU	OK, NG	Displays a self-diagnosis result of AU board in connection with CCU.
		TR	OK, NG	Displays a self-diagnosis result of TR board in connection with CCU.

c) When executing the LEVEL AUTO, data set through the menu is all cleared and the automatic level adjustment is performed in sequence, After the adjustment is complete, adjustment result is stored as a master setup data.
1. A reference file which is reference for adjustment is loaded .
2. Lens is autmatically closed and the black balance is automatically adjusted.
3. The white balance is automatically adjust using TEST 2 (3-step) signal.

Notes

This white balance adjustment compensates a drift of the gain of an amplifier, does not compensate color temperature for an actual object.
The gamma and knee compensation values do not change with a lapse of time because of the digital-processing camera.
Therefore, the gamma and knee compensation values remains the values stored in the reference file.

Page	Ver.	Item	Settings	Contents
CAMERA ID		No.	1 to 96 (X)	Sets a camera number in the range of 1 to 96. (When no camera number is set, "- -" is displayed.)
		ID: □□□□□□□□		Sets a camera ID of up to ten alphanumerics, symbols, and spaces.
	1.10	No. / ID ON BARS	CAM No., CAM ID, OFF	Selects whether the camera number or ID is mixed with a camera output signal only in the color-bar mode, or not. (This setting is valid only when the DISPLAY switch is set to on or off.)
LENS FILE	1.10	CENTER H POS	–20 to 20 (XX)	Shifts horizontally the location of the center marker on the screen. 20 (right) ↔ –20 (left)
	1.10	CENTER V POS	–20 to 20 (XX)	Shifts vertically the location of the center marker on the screen. 20 (up) ↔ –20 (down)
	1.10	CENTER POS STORE	Throw MENU SELECT switch to ENTER to execute	Stores the location of the center marker at present in the selected lens file number.
	1.10	No.	0 to 15	Shows a lens file number. (A lens file appropriate for the mounted lens is automatically selected.) d) (Example) No. : 1 ← Lens file number (0 to15) Lens:27:A14x8BERM ← Lens name EX: 1.0 ← Lens extender value

d) Fifty kinds of lenses are registered at the factory in the ROM IC36/AT-95 board. Up to 16 of these lenses can be stored as the lens file in the RAM IC26/AT-95 board. An additional data such as a center marker is also stored in the selected lens file.

3-1-2. Paint Menu

The Paint menu is used for white and other paint adjustments items. To activate the Paint menu, first display the TOP menu.

(Boxed items under "Settings" indicate the factory setting.)

Page	Ver.	Item	Settings	Contents
VIDEO LEVEL		WHITE R/G/B	–99 to 99 (0)	Adjusts the R, G, B gain level.
		BLACK R/G/B/M	–99 to 99 (0)	Adjusts the R, G, B master black level.
		FLARE R/G/B	–99 to 99 (0)	Adjusts the R, G, B flare level.
		GAMMA R/G/B/M	–99 to 99 (0)	Adjusts the R, G, B master gamma correction curve.
		FLARE	ON, OFF	Turns the flare correction circuit on and off.
		TEST	1, 2, OFF	Selects the test signal. 1 : Outputs the sawtooth waveform test signal 2 : Outputs 3-step waveform test signal OFF : no test signal is output
		CLEAR	Throw MENU SELECT switch to ENTER to execute.	Sets all settings on the VIDEO LEVEL page to 0. (When you throw MENU SELECT switch to ENTER, the "CLEAR" indication flashes. Throw MENU SELECT switch to ENTER again to execute; throw to CANCEL to cancel.)
DETAIL1		DETAIL	ON, OFF	Turns the function on and off to improve resolution by adding the detail signal.
		LEVEL	–99 to 99 (0)	Adjusts the master level for the detail signal.
		LIMITTER	–99 to 99 (0)	Adjusts the clipping level against the maximum detail level.
		CRISPENING	–99 to 99 (0)	Adjusts the level at which the detail signal is crispened.
		LEVEL DEP	–99 to 99 (0)	Adjusts the level to control the detail signal used at lower signal level.
		LEVEL DEP	ON, OFF	Turns the level depend function on and off.
		TEST	1, 2, OFF	Selects the test signal. 1 : Outputs the sawtooth waveform test signal 2 : Outputs 3-step waveform test signal OFF : No test signal is output
		CLEAR	Throw MENU SELECT switch to ENTER to execute.	Sets all settings on the DETAIL 1 page to 0. (When you throw MENU SELECT switch to ENTER, the "CLEAR" indication flashes. Throw MENU SELECT switch to ENTER again to execute; throw to CANCEL to cancel.)
DETAIL2		DETAIL	ON, OFF	Turns the function on and off to improve resolution by adding detail signal.
		H/V RATIO	–99 to 99 (0)	Adjusts the mix ratio of H and V detail signal.
		FREQUENCY	–99 to 99 (0)	Adjusts the boost frequency for H detail signal.
		MIX RATIO	–99 to 99 (0)	Adjusts the mix ratio of H detail signal used before and after the gamma compensation circuit.
		W.LIMITTER	–99 to 99 (0)	Adjust the clipping level adainst the higher detail signal at the maximum level.
		B.LIMITTER	–99 to 99 (0)	Adjusts the clippping level against the lower detail signal at the minimum level.
		COMB	–99 to 99 (0)	Sets the effect volume of the comb filter 99 (Causes less cross colors.) ↔ –99 (Yields clear pictures, but causes more cross colors.) * For a PAL model, this function has the effect on not every object but a specified object.
		KNEE APRT.	ON, OFF	Turns the knee aperture function on and off.
		TEST	1, 2, OFF	Selects the test signal. 1 : Outputs the sawtooth waveform test signal 2 : Outputs 3-step waveform test signal OFF : No test signal is output
(Continued)				

Page	Ver.	Item	Settings	Contents
DETAIL2		CLEAR	Throw MENU SELECT switch to ENTER to execute	Sets all settings on the DETAIL2 page to 0. (When you throw MENU SELECT switch to ENTER, the “CLEAR” indication flashes. Throw MENU SELECT switch to ENTER again to execute; throw to CANCEL to cancel.)
SKIN DETAIL		SKIN DETAIL	ON, [OFF]	Turns the skin detail function on and off.
		LEVEL	–99 to 99 ([0])	Adjusts the level of the skin detail.
		PHASE	100° to 170°([120])	Adjusts the hue for the skin detail function.
		WIDTH	0° to 90° ([60])	Adjusts the color width for the skin detail function.
		SATURATION	–99 to 99 ([0])	Adjusts the color saturation of the skin detail function.
		GATE	ON, [OFF]	Turns the area display of the skin detail function in the viewfinder screen.
	1.10	AUTO HUE	Throw MENU SELECT switch to ENTER to execute.	Sets the range of skin detail hue function automatically. (Locate the desired skin color within the gate marker of VF and measure.)
		CLEAR	Throw MENU SELECT switch to ENTER to execute.	Sets all settings on the SKIN DETAIL page to 0. (When you throw MENU SELECT switch to ENTER, the “CLEAR” indication flashes. Throw MENU SELECT switch to ENTER again to execute; throw to CANCEL to cancel.)
GAMMA		GAMMA, R/G/B/M	–99 to 99 ([0])	Adjusts the R, G, B and master gamma level.
		COARSE	0.40, [0.45], 0.50	Selects the gamma value in steps.
		GAMMA	[ON], OFF	Turns the gamma value on and off.
	1.07	BLACK GAMMA	–99 to 99 ([0])	Adjusts the black gamma (master). e)
	1.07	BLACK GAMMA	ON, [OFF]	Turns the black gamma function on and off. e)
		TEST	1, 2, [OFF]	Selects the test signal. 1 : Outputs the sawtooth waveform test signal 2 : Outputs 3-step waveform test signal OFF : No test signal is output
		CLEAR	Throw MENU SELECT switch to ENTER to execute.	Resets all settings on the GAMMA page to the factry settings. (When you throw MENU SELECT switch to ENTER, the “CLEAR” indication flashes. Throw MENU SELECT switch to ENTER again to execute; throw to CANCEL to cancel.)
KNEE/W.CLIP		POINT	–99 to 99 ([0])	Adjusts the knee point level when the function is OFF.
		SLOPE	–99 to 99 ([0])	Adjusts the knee slope level when the function is OFF.
		KNEE	[ON], OFF	Turns the knee function on and off.
		AUTO KNEE	ON, [OFF]	Turns the auto knee function on and off.
		KNEE MAX	ON, [OFF]	Turns on and off the knee max function which changes the slope to completely collapsed form.
		WHITE CLIP	–99 to 99 ([0])	Adjusts the white clip level.
		WHITE CLIP	[ON],OFF	Turn the white clip function on and off.
		TEST	1, 2, [OFF]	Selects the test signal. 1 : Outputs the sawtooth waveform test signal 2 : Outputs 3-step waveform test signal OFF : No test signal is output
		CLEAR	Throw MENU SELECT switch to ENTER to execute.	Sets all settings on the KNEE/W.CLIP page to 0. (When you throw MENU SELECT switch to ENTER, the “CLEAR” indication flashes. Throw MENU SELECT switch to ENTER again to execute; throw to CANCEL to cancel.)

e) This function is inhibited while TALLY lamps are lit or by the setting of the System Config menu.
A noise appears on the screen during operation.

Page	Ver.	Item	Settings	Contents
MATRIX		G-R, B-R	–99 to 99 ([0])	Compensates the user's matrix (sets an optional value as the constant for G-R, B-R, R-G, B-G, R-B and G-B).
		R-G, B-G	–99 to 99 ([0])	
		R-B, G-B	–99 to 99 ([0])	
		MATRIX	[ON], OFF	Turns the matrix compensation on and off.
		USER f)	[ON], OFF	Turns the user's matrix compensation on and off.
		PRESET f)	[ON], OFF	Turns on and off only the preset matrix compensation (fixed constant compensation).
		TEST	1, 2, [OFF]	Selects the test signal. 1 : Outputs the sawtooth waveform test signal 2 : Outputs 3-step form test signal OFF : No test signal is output
		CLEAR	Throw MENU SELECT switch to ENTER to execute.	Sets all settings on the MATRIX page to 0. (When you throw MENU SELECT switch to ENTER, the "CLEAR" indication flashes. Throw MENU SELECT switch to ENTER again to execute; throw to CANCEL to cancel.)
SCENE FILE		1	Storing and recalling a scene file (painting data corresponding to a shot scene)	
		2	**Storing a scene file**	
		3	1 Turn MENU SELECT knob to move the → cursor to "FILE STORE," then throw MENU SELECT switch to ENTER. "FILE STORE" flashes on the viewfinder screen.	
		4		
		5	2 Select the file number (1 to 5) to be stored to.	
		FILE STORE	(If data is already stored at the selected location, the new data replaces the current data.) **Recalling a scene file** Turn MENU SELECT knob to move the → cursor to the file number whose data is to be recalled, then throw MENU SELECT switch to ENTER. • Every time MENU SELECT switch is pushed up to ENTER, the scene file data replaces the current settings. • When the scene file is recalled, an asterisk appears next to the number.	
		STANDARD	Returns the current amount of paint adjustments and switch setting to their reference value stored as a reference file.	
SHUTTER	1.10	SELECT	[OFF], SHUTTER, EVS, ECS	Selects the shutter, EVS, or ECS mode.
	1.10	SHUTTER	$\frac{1}{100}$ (or $\frac{1}{60}$), $\frac{1}{125}$, $\frac{1}{250}$, $\frac{1}{500}$, $\frac{1}{1000}$, $\frac{1}{2000}$	Selects the shutter speed.
	1.10	ECS	h)	Sets the ECS (CLS) frequency.
	1.10	S-EVS	[0] to 100%	Sets the desired resolution in %. (This setting is invalid with the OHB-400/400P installed.)
OTHERS	1.09	16:9/4:3 MODE	[16:9], 4:3	Selects the aspect ratio for the video signal output. i)

f) When both USER and PRESET are set to ON, the matrix constant compensation is total value of the USER and PRESET matrix.
h) Variable range differs depending on the OHB in use. For details refer to the operation manual supplied with the OHB.
i) The aspect ratio normally corresponds to the CCU's setting when the CCU is connected. To forcefully select, use this menu.

3-1-3. Maintenance Menu

The Maintenance menu is used for encoder output level and other adjustments items necessary for camera's maintenance. The Maintenance menu is not normally accessible. To display this menu, switch setting of the AT-95 board is required.
For details, refer to Section 1-5. "Function of Internal Switches—AT-95 board".
To activate the Maintenance menu, first display the TOP menu.

(Boxed items under "Settings" indicate the factory setting.)

Page	Ver.	Item	Settings	Contents
VBS		SYNC LEVEL	-99 to 99 (XX)	Adjusts the sync level of camera's encoder output signal.
		Y LEVEL	-99 to 99 (XX)	Adjusts the Y level of camera's encoder output signal.
		BURST LEVEL	-99 to 99 (XX)	Adjusts the burst level of camera's encoder output signal.
		CHROMA LEVEL	-99 to 99 (XX)	Adjusts the chroma level of camera's encoder output signal.
		Q/V LEVEL	-99 to 99 (XX)	Adjusts the Q (or V) level of camera's encoder output signal.
		SET UP	-99 to 99 (XX)	Adjusts the sync level of camera's encoder output signal. (This setting is valid only for NTSC.)
		BF PHASE	-99 to 99 (XX)	Adjusts the burst phase of camera's encoder output signal.
		SC-H PHASE	-99 to 99 (XX)	Adjusts the SC-H phase of camera's encoder output signal.
		V BLANKING	19, 20 ,21H	Adjusts the V blanking width of camera's encoder output signal. (This setting is valid only for NTSC.) In connection with CCU, the width is fixed to 19H. * For a PAL model, the width is fixed to 25H at all times.
WHITE SHADING		V SAW R/G/B	-99 to 99 (XX)	Adjusts the volume of V.SAW compensation for the R, G,or B white shading.
		V PARA R/G/B	-99 to 99 (XX)	Adjusts the volume of V.PARA compensation for the R, G, or B white shading.
		H SAW R/G/B	-99 to 99 (XX)	Adjusts the volume of H.SAW compensation for the R, G, or B white shading.
		H PARA R/G/B	-99 to 99 (XX)	Adjusts the volume of H.PARA compensation for the R, G, or B white shading.
		WHITE R/G/B	-99 to 99 (XX)	Adjusts the R, G, or B white level.
		V MOD R/G/B/M	-99 to 99 (XX)	Adjusts the volume of V.SAW compensation for the R, G, B or master modulation shading of the lens and prism.[j]
		V MOD	ON, OFF	Turns the V modulation shading on and off.
		AUTO WHITE	Throw MENU SELECT switch to ENTER to execute.	Starts to automatically adjust the white balance.
		CLEAR	Throw MENU SELECT switch to ENTER to execute.	Resets numeric settings to "0" on the WHITE SHADING page. (When you throw MENU SELECT switch to ENTER, the "CLEAR" indication flashes. Throw MENU SELECT switch to ENTER again to execute; throw to CANCEL to cancel.)
BLACK SHADING		V SAW R/G/B	-99 to 99 (XX)	Adjusts the volume of V.SAW compensation for the R, G, or B black shading.
		H SAW R/G/B	-99 to 99 (XX)	Adjusts the volume of H.SAW compensation for the R, G, or B black shading.
		BLK SET R/G/B	-99 to 99 (XX)	Adjusts the volume of BLACK SET compensation for the R, G, or B. (Adjusts for each gain.)
		BLACK R/G/B/M	-99 to 99 (XX)	Adjusts the R, G, B or master black level.
		MASTER GAIN	-3,0,3,6,9,12,18, 24,30 dB (X)	Selects the master gain value.
(Continued)		AUTO BLACK	Throw MENU SELECT switch to ENTER to execute.	Starts to automatically adjust the black balance.

j) When the master modulation shading is adjusted, the V. SAW component for the R and B V-modulation shadings of the prism is simultaneously compensated.

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Page	Ver.	Item	Settings	Contents
BLACK SHADING		CLEAR	Throw MENU SELECT switch to ENTER to execute.	Resets numeric settings to “0” on the BLACK SHADING page. (When you throw MENU SELECT switch to ENTER, the “CLEAR” indication flashes. Throw MENU SELECT switch to ENTER again to execute; throw to CANCEL to cancel.)
AUTO SET UP		AUTO BLACK	Throw MENU SELECT switch to ENTER to execute.	Starts to automatically adjust the black balance.
		AUTO BLACK	Throw MENU SELECT switch to ENTER to execute.	Starts to automatically adjust the black balance. (To abort a processing during execution, throw MENU SELECT switch to ENTER.)
		LEVEL AUTO	Throw MENU SELECT switch to ENTER to execute.	Starts to automatically adjust the level in the internal circuits. c) (To abort a processing during execution, throw MENU SELECT switch to ENTER.)
	1.10	AUTO HUE	Throw MENU SELECT switch to ENTER to execute.	Sets the skin detail hue function automatically. (Locate the desired skin color within the gate marker of VF and measure.)
		WHITE SHADING	Throw MENU SELECT switch to ENTER to execute.	Starts to automatically adjust the white shading. (To abort a processing during execution, throw MENU SELECT switch to ENTER.)
		BLACK SHADING	Throw MENU SELECT switch to ENTER to execute.	Starts to automatically adjust the black shading. k) (To abort a processing during execution, throw MENU SELECT switch to ENTER.)
	1.10	COLOR REF (SELF)	Throw MENU SELECT switch to ENTER to execute.	Makes a color reference to compensate the difference in colors between OHBs using a single camera. (Locate the desired colors of a Macbeth chart within the gate marker of VF and measure. To abort a processing during execution, throw MENU SELECT switch to ENTER.) m)
	1.10	COLOR SETUP (SELF)	Throw MENU SELECT switch to ENTER to execute.	Automatically calculates the color matrix from the reference. (Locate the desired colors of a Macbeth chart within the gate marker of VF and measure. To abort a processing during execution, throw MENU SELECT switch to ENTER.) n)
DATE/TIME		DD/MM/YY HH:MM:SS		Adjusts a built-in timer. (HH;hour/MM;minute only)
		DATE ON BARS	ON, [OFF]	Selects whether the date characters are mixed with a camera output signal in the color-bar mode, or not. (This setting is valid only when the DISPLAY switch is set to on or off.)
		TIME ON BARS	ON, [OFF]	Selects whether the time characters are mixed with a camera output signal in the color-bar mode, or not. (This setting is valid only when the DISPLAY switch is set to on or off.)

c) When executing the LEVEL AUTO, data set through the menu is all cleared and the automatic level adjustment is performed in sequence, After the adjustment is complete, adjustment result is stored as a master setup data.
1. A reference file which is reference for adjustment is loaded .
2. Lens is autmatically closed and the black balance is automatically adjusted.
3. The white balance is automatically adjust using TEST 2 (3-step) signal.

Notes

This white balance adjustment compensates a drift of the gain of an amplifier, does not compensate color temperature for an actual object.
The gamma and knee compensation values do not change with a lapse of time because of the digital-processing camera.
Therefore, the gamma and knee compensation values remains the values stored in the reference file.

k) Before first using the camera with the OHB-400/500/500WS (or their PAL version) installed, or After replacing the CCD unit, be sure to execute the automatic black shading adjustment.

m) When performing compensation between two or more cameras, use the MSU.

n) Differing from the color-setup operation by plural cameras, a data transfer is not performed.
Execute to recalculate. After execution, the color matrix data is temporarily reflected in the OHB matrix of the System Config menu.
Execute the OHB FILE STORE of the Triming menu to store the color matrix data.

Page	Ver.	Item	Settings	Contents
OTHERS		S/N MEASURE	ON, [OFF]	ON : Set to ON in mesuring the S/N ratio. And settings of the DETAIL, CHROMA, GAMMA, MATRIX, and FLARE will be temporarily turned OFF. OFF : Settings of DETAIL and so on are returned as they were.
		MOD	ON, [OFF]	ON : Set to ON in mesuring the modulation depth. And settings of the MEASUREDETAIL, GAMMA, MATRIX, and FLARE will be temporarily turned OFF. OFF : Settings of DETAIL and so on are returned as they were.
		MASTER BLACK	-99 to 99 ([0])	Adjusts the master black in measuring the S/N ratio and modulation depth.
		DETAIL	[ON], OFF	
		CHROMA	[ON], OFF	
		GAMMA	[ON], OFF	
		MATRIX	[ON], OFF	
		FLARE	[ON], OFF	

3-1-4. Reference Menu

The Reference menu stores the reference values used for automatic setup adjustment and the standard settings of the switches as the reference files. And the menu can clear the current reference files. The Reference menu is not normally accessible. To display this menu, switch setting of the AT-95 board is required. For details, refer to Section 1-5. "Function of Internal Switches—AT-95 board". To activate the Reference menu, first display the TOP menu.

Notes

1. Executing the FILE STORE on the REFERENCE FILE page registers settings of items, which have been set through the Paint, Maintenance and System config menus just before the file store, as the reference values.
2. When changed numbers of items are returned to the reference values stored as the reference files, recall the standard file using an MSU/RCP or the setup menu.

Page	Ver.	Item	Settings	Contents
REFERENCE FILE		FILE STORE	Throw MENU SELECT switch to ENTER to execute.	Stores the adjustment value on each item as the reference value.
		CLEAR FILE	Throw MENU SELECT switch to ENTER to execute.	Clears the adjustment values stored as the reference files. (Temporarily clears the current reference files p).)

p) If the power is turned off without execution of the FILE STORE after clearing the file, the original setting is restored.

3-1-5. Triming Menu

The Triming menu stores the adjustment data in replacing parts as the triming files. And the menu can clear the current adjustment values. The Triming menu is not normally accessible. To display this menu, switch setting of the AT-95 board is required. For details, refer to Section 1-5. "Function of Internal Switches—AT-95 board". To activate the Triming menu, first display the TOP menu.

Note

Executing the FILE STORE on the TRIMING FILE page registers settings of items, which have been set through the Maintenance and System config menus just before the file store, as the reference values.

Page	Ver.	Item	Settings	Contents
TRIMING FILE		FILE STORE	Throw MENU SELECT switch to ENTER to execute.	Stores the adjustment value on each item as the reference value.
		CLEAR FILE	Throw MENU SELECT switch to ENTER to execute.	Clears the adjustment values stored as the triming files. (Temporarily clears the current triming files p).)
OHB FILE		FILE STORE	Throw MENU SELECT switch to ENTER to execute.	Stores specific data for a CCD unit to be used as the OHB files. The standard values are stored at the factory. (Stores the offset value, OHB matrix data and so on.)
LENS FILE	1.10	LENS FILE STORE	Throw MENU SELECT switch to ENTER to execute.	Stores specific data for a lens to be used as the lens files. The standard values are stored at the factory.
	1.10	SELECT CURRENT LENS	0 to 49	Loads a lens data into the lens file selected at present by the LENS FILE page of the Operation menu.
	1.10	RESET ALL LENS	Throw MENU SELECT switch to ENTER to execute.	Resets all of 16 lens files. (Example) No. : 1 ← Lens stored number (0 to 49) Lens:27:A14x8BERM ← Lens name EX: 1.0 ← Lens extender value

p) If the power is turned off without execution of the FILE STORE after clearing the file, the original setting is restored.

3-1-6. System Config Menu

The System config menu is used for adjustments items necessary to replace a printed circuit board or some parts of the camera. The System config menu is not normally accessible. To display this menu, switch setting of the AT-95 board is required. For details, refer to Section 1-5. “Function of Internal Switches—AT-95 board”. To activate the System config menu, first display the TOP menu.

(Boxed items under “Settings” indicate the factory setting. XX or XXX represents two or three digits in hexadecimal.)

Page	Ver.	Item	Settings	Contents
DATE/TIME		YY/MM/DD HH:MM:SS		Adjusts the built-in calender and timer.
		RESET	Turn MENU SELECT knob to execute.	Resets hour (HH), minute (MM) and second (SS) of the timer.
Y/CHROMA		SC FREQ	XXX ([XX])	Adjusts the camera’s subcarrier frequency.
		Y SYNC	XXX ([XX])	Adjusts the sync level of camera’s Y output signal.
		Y SETUP	XXX ([XX])	Adjusts the setup level of camera’s Y output signal.
		Y VIDEO	XXX ([XX])	Adjusts the Y level of camera’s Y output signal.
		TEST SETUP	XXX ([XX])	Adjusts the setup level of camera’s encoder output signal.
		BURST LVL	XXX ([XX])	Adjusts the burst level of camera’s encoder output signal.
		CHROMA LVL	XXX ([XX])	Adjusts the chroma level of camera’s encoder output signal.
		Q/V LEVEL	XXX ([XX])	Adjusts the Q(V) level of camera’s encoder output signal.
		SC-H PHASE	XXX ([XX])	Adjusts the SC-H phase of camera’s encoder output signal.
		REG LVL	XXX ([XX])	Adjusts the level of the R, G and B output signals.
		CB	ON, [OFF]	Turns on and off the camera color-bar signal to be output in setting each item on the Y/CHROMA page.
PR/VA/TEST		PR ADG R/G/B	XXX ([XX])	Adjusts the reference level of the AD converter for R/G/B signals on the PR board.
		VA MOD R/G/B	XXX ([XX])	Adjusts the R, G or B modulation balance for the VA board.
		G CLOCK	XXX ([XX])	Adjusts the clock pulse in phase to be input to the AD converter for G signal on the PR board. (Note : In replacing OHB, readjustment is required to set the maximum value of the modulation depth.
		R/B CLOCK	XXX ([XX])	Adjusts the clock pulse in phase to be input to the AD converter for R/B signals on the PR board. (Note: In replacing OHB, readjustment is required to set the minimum level of a pseudo signal.)
		M.BLACK	XXX ([XX])	Adjusts the master black signal.
		TEST2 HI	XXX ([XX])	Adjusts the high level of the TEST2 (3-STEP) signal on the VA board.
		TEST2 MID	XXX ([XX])	Adjusts the middle level of the TEST2 (3-STEP) signal on the VA board.
		TEST CLIP	XXX ([XX])	Adjusts the clip level of the TEST1 (sawtooth) signal on the VA board.
		TEST	1, 2, [OFF]	Selects a TEST signal to be output in setting each item on the PR/VR/TEST page. 1 : Outputs the sawtooth test signal 2 : Outputs the 3-step waveform test signal OFF : No test signal is output
PRE KNEE/ ZEBRA		PREKNEE1 R/G/B	XXX ([XX])	Adjusts the R, G or B pre-knee 1 level on the VA board.
(Continued)		PREKNEE2 R/G/B	XXX ([XX])	Adjusts the R, G or B pre-knee 2 level on the VA board.
		APERTURE	XXX ([XX])	Adjusts the aperture compensation signal level.

Page	Ver.	Item	Settings	Contents
PRE KNEE/ ZEBRA		WHITE CLIP	XXX ([XX])	Adjusts the white clip level.
		WHITE CLIP	[ON], OFF	Turns the white clip function on and off.
		ZEBRA1 LEVEL, RANGE	XXX ([XX])	Sets the center value and range for the zebra 1 signal detection.
		ZEBRA2 LEVEL	XXX ([XX])	Sets the detection value for the zebra 2 signal.
		Z.DISP	1,2, [1&2]	Selects a zebra signal to be displayed on the viewfinder. 1 : Zebra 1 signal 2 : Zebra 2 signal 1&2 : Both zebra 1 and 2 signals are displayed at the same time.
		TEST	1, 2, [OFF]	Selects a TEST signal to be output in setting each item on the PREKNEE/ZEBRA page. 1 : Outputs the sawtooth test signal 2 : Outputs the 3-step waveform test signal OFF : No test signal is output
VTR/CCU		VTR R-Y	XXX ([XX])	Adjusts the R-Y color-difference signal level.
		VTR B-Y	XXX ([XX])	Adjusts the B-Y color-difference signal level.
		CCU Y SAMP	XXX ([XX])	Adjusts the level of the sample pulse to be mixed with the Y signal.
		CCU R-Y SYNC	XXX ([XX])	Adjusts the level of the sync pulse to be mixed with the R-Y signal.
		CCU B-Y SAMP	XXX ([XX])	Adjusts the level of the sample pulse to be mixed with the B-Y signal.
		RGB OFFSET	XXX ([XX])	Adjusts the G signal level.
		TEST	1, 2, [OFF]	Selects a TEST signal to be output in setting each item on the VTR/CCU page. 1 : Outputs the sawtooth test signal 2 : Outputs the 3-step waveform test signal OFF : No test signal is output
		CB	ON, [OFF]	Turns on and off the camera color-bar signal to be output in setting each item on the VTR/CCU page.
IRIS		LEVEL	XXX ([XX])	Adjusts the auto-iris level.
		APL RATIO	XXX ([XX])	Sets the way the iris is automatically adjusted. -99 (PEAK) ↔ 99 (AVERAGE)

Page	Ver.	Item	Settings	Contents
COLOR SETUP	1.10	COLOR REF (SELF)	Throw MENU SELECT swich to ENTER to execute.	Makes a color reference to compensate the difference in colors between OHBs using a single camera. (Locate the desired colors of a Macbeth chart within the gate marker of VF and measure. To abort a processing during execution, throw MENU SELECT switch to ENTER.) m)
	1.10	COLOR SETUP (SELF)	Throw MENU SELECT swich to ENTER to execute.	Automatically calculates the color matrix from the reference. (Locate the desired colors of a Macbeth chart within the gate marker of VF and measure. To abort a processing during execution, throw MENU SELECT switch to ENTER.) n)
	1.10	(OHB MATRIX) G-R, B-R R-G, B-G R-B, G-B	 -99 to 99 ([0]) -99 to 99 ([0]) -99 to 99 ([0])	Compensates the OHB matrix to adjust the difference between OHBs or cameras (sets an optional value as the constant for G-R, B-R, R-G, B-G, R-B and G-B). r)
	1.10	OHB MTX	[ON], OFF	Turns the OHB matrix compensation on and off.
	1.10	CM ADD LVL	[0] to 16	For fine adjustment in color-setup operation. Compensates the caluculation value for the color selected by the CM ADD COLOR in 16 steps and recalculates the OHB matrix. (Selecting 0 turns off the function.) s) t)
	1.10	CM ADD COLOR	[0] to 17	For fine adjustment in color-setup operation. Select a color to be compensated from 18 colors of the Macbeth chart with the gate marker of VF. Recalculates the OHB matrix. t)

m) When performing compensation between two or more cameras, use the MSU.
n) Differing from the color-setup operation by plural cameras, a data transfer is not performed.
Execute to recalculate. After execution, the color matrix data is temporarily reflected in the OHB matrix of the System Config menu.
Execute the OHB FILE STORE of the Triming menu to store the color matrix data.
r) Adjust with the MATRIX of the Paint menu turned OFF. Execute the OHB FILE STORE to store the adjustment values.
s) The compensation value is temporarily reflected in the OHB matrix of the System Config menu after execution of the COLOR SETUP(SELF). Execute the OHB FILE STORE of the Triming menu to store the value.
The higher you set the value of the CM ADD LVL, the more the weights are assigned to the color selected by the CM ADD COLOR.
The compensation is performed so as to entirely minimize the error, while reducing the error for the weights-assigned color.
t) After powered off once following the completion of color-setup operation, recalculation is not performed.

Page	Ver.	Item	Settings	Contents
OTHERS 1		FILTER,WHT MEM	[ON], OFF	Does not function in the unit. (The setting change becomes invalid.)
		NTSC ENC	[WIDE], NRW	Sets the band width of the Q signal for the NTSC color encoder.
		ROTARY	[STD], RVS	Selects the mode of MENU SELECT knob as turned clockwise. STD : Cursor moves downwards and a numeric value increases. RVS : Cursor moves upwards and a numeric value decreases.
		OWN CALL	R, [F&R], OFF	Selects whether TALLY lamps are lit corresponding to the CALL button on rear panel pressed, or not. Or selects which TALLY lamps are lit when the CALL button is pressed. (This setting is valid in connection with CCU. When the standalone unit is installed and MSU/RCP is not connected to the camera, it is always set to OFF.) R : Red TALLY lamps of VF are lit. R&F : Red TALLY lamps of VF and UP TALLY lamps of VF and camera are lit. OFF : No TALLY lamp is lit corresponding to the CALL button.
		CENTER H POS	–20 to 20 ([XX])	Shifts horizontally the location of the center marker on the screen. 20 (right) ↔ –20 (left)
		CENTER V POS	–20 to 20 ([XX])	Shifts vertically the location of the center marker on the screen. 20 (up) ↔ –20 (down)
		LENS VTR S/S	TALK, [RET2]	Selects the mode of VTR S/S SW of the lens. TALK : VTR S/S SW functions as INCOM TALK SW (momentary). RET2 : VTR S/S SW functions as RET2 SW.
		VF ? DISPLAY	[ON], OFF	Turns on and off the indication of ? mark at the top-right of the VF screen with the DISP switch set to ON when the self-diagnosis result is NG (no good) and so on.
		PinP RET RVS	[RVS1], RVS 2, OFF	Selects the indication mode of VF display in PinP mode.

Setting	RET 1 (or 2, 3) SW	Large screen	Small screen
RVS 1	ON	RET 1 (2, 3) video	Camera output
	OFF	Camera output	The last RET video selected
RVS 2	ON	RET 1 (2, 3) video	Camera output
	OFF	Camera output is displayed on the whole screen. (Small screen is not displayed.)	
OFF	ON	Camera output	RET 1 (2, 3) video
	OFF	Camera output is displayed on the whole screen. (Small screen is not displayed.)	

* To output RET 3 video signal, press RET 1 and 2 switches at the same time.

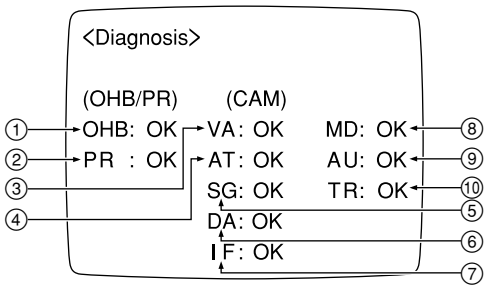
OTHERS 2		F TALLY RVS	[ON], OFF	Selects the operation mode of TALLY lamps corresponding to a CALL button pressed when a TALLY signal is input to the camera from CCU or VTR. ON : Red TALLY lamps of VF and UP TALLY lamps of VF and camera go out. OFF : Red TALLY lamps of VF alone go out.
	1.07	BLK GAM INHIBIT	[ON], OFF	ON : Inhibits the black gamma adjustment and on/off function from the MSU or Paint manu. OFF : Enables the above operation.
	1.10	CHAR CAM No.	[1,2,3], A,B,C	Selects the indication mode of the camera number set by the CAMERA No. page of Operation menu. 1,2,3 : Indicates in numerics. A,B,C : Indicates camera numbers 1 to 27 in alphabetical order of A to Z. (When connecting 28 or more cameras, select “1,2,3”.)
	1.10	WHT SETUP MODE	[AWB], LEVEL	AWB : After executing the LEVEL AUTO, white balance adjustment data returns to the value before execution. LEVEL : After executing the LEVEL AUTO, white balance adjustment data changes to the value after the white balance is adjusted using TEST 2 signal.
	1.10	AW SHADING MODE	[RGB], RB ONLY	RGB : When automatically adjusting the white balance, R, G, and B signal waveforms are all flattened. RB ONLY : When automatically adjusting the white balance, R and B signal waveforms are flattened.

3-2. Self-Diagnosis

The BVP-500/500P has a diagnosis mode used for self-diagnosis of every plug-in board and the OHB. The diagnosis page is displayed on the viewfinder screen.

- Operation
  Select “Diagnosis” page of the Operation menu referring to Section 3-1.

- Viewfinder Screen



- Display Descriptions

Marks	Board/Block	Judging Point	Expected Abnormality
①	OHB(CCD UNIT)	Communication with IC18, IC19/TG-159	Communication error
②	PR-211	Communication with IC49	Communication error
③	VA-163	Communication with IC26	Communication error
④	AT-95	Communication with IC46	Communication error
⑤	SG-234	Communication with IC21	Communication error
⑥	DA-88	Communication with IC10	Communication error
⑦	IF-538	Communication with IC603	Communication error
⑧	MD-103	Y RF output Color-difference RF output	• RF carrier levels for Y and R-Y/B-Y are out of specs. * • Improper connection of the board
⑨	AU-211	+7.5 V and INCOM +7.5 V	• Power voltage for the board is out of specs. * • Improper connection of the board
⑩	TR-90	RF output (TP3)	• Carrier level for AUDIO RF is out of specs. * • Improper connection of the board

* Only when no video signal is input.

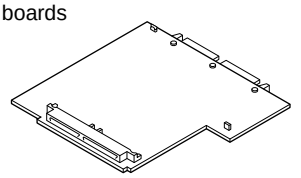
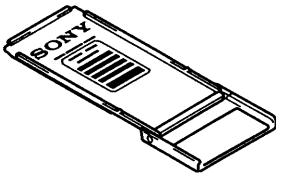
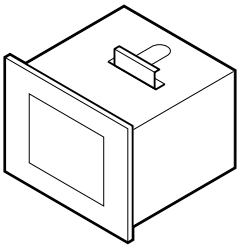
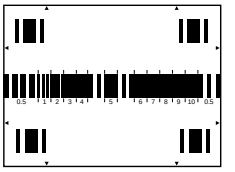
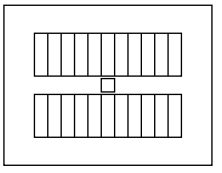
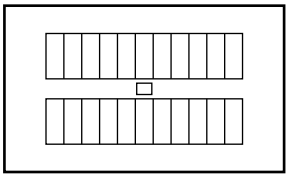
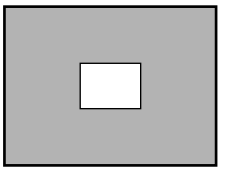
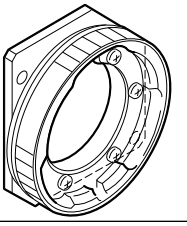
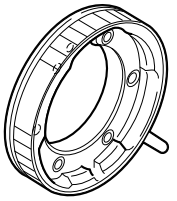
Note

When the BVP-500/500P is not connected to the CCU, the columns ⑧,⑨ and ⑩ will display “– –”.

Section 4
Alignment for OHB Installation

4-1. Preparation

4-1-1. Equipment Required

Extension board EX-464	Extension board BKP-7900 (Option)
Sony P/N: J-6395-040-A For BVP-500/500P plug-in boards 	For CCU-700/700P plug-in boards 
Multiburst Chart	**Pattern box PTB-500**
Sony P/N: J-6026-110-A 	**Sony P/N: J-6029-140-B** • Light source for test chart Power supply AC90 to 240V 
Grayscale Chart	**Grayscale Chart (16:9)**
Sony P/N: J-6026-130-B 	**Sony P/N: J-6394-080-A** 
White Window Chart	**Portable Lens Attachement**
Make a square hole at the center of a black sheet of paper. 	**Sony P/N: J-6395-080-A** For OHB-400 series 
Portable Lens Attachment	
Sony P/N: J-6395-090-A For OHB-500/500WS series 	

Measuring Equipment

- Frequency counter
  Advantest TR5821AK or equivalent
- Oscilloscope
  Tektronix 2465 or equivalent
- Waveform monitor/Vectorscope
  Tektronix 1750 or equivalent (for NTSC)
  Tektronix 1751 or equivalent (for PAL)
- Digital voltmeter
  Advantest TR6845 or equivalent
- Video signal generator
  Tektronix 1410 or equivalent (for NTSC)
  Tektronix 1411 or equivalent (for PAL)
- Color monitor
  Sony BVM-1911/2811 or equivalent (for NTSC)
  Sony BVM-2011P/3011P or equivalent (for PAL)

Peripheral Equipment

- CCD unit : OHB-400/500/500WS series
- Camera control unit : CCU-700/700P/700A/700AP
- Master setup unit : MSU-700
- TRIAX cable (Standard length: 150 m)

4-1-2. Notes on Adjustment

- All measuring equipment shall be calibrated.
- Also the alignment for the OHB-400/500/500WS (or their PAL version), CCU-700/700P/700A/700AP, and MSU-700 shall be completed.
- To connect each equipment, refer to Section 4-1-4.
- As for initial settings before beginning adjustment, refer to Section 4-1-5.
- Be sure to turn off the power switch on the power assembly of the camera before disconnecting the printed circuit boards.

  Note

  Allow for about ten seconds until the unit is energized when turning this switch off and then on momentarily.
- About ten-minute warm-up time is allowed before beginning adjustment.
- When using the camera as 16:9 mode together with the OHB-500WS/500WSP, use the specified grayscale chart (J-6394-080-A).
- Paste a black colored velvets (around 3 × 3 cm) to both sides of the white portion in the center of the grayscale chart.

  (For more details, consult your Sony service representative.)

4-1-3. Description of Setup Menu

A part of adjustments given in this section uses the setup menu. The setup menu consists of the following menus. Besides there is a TOP menu indicating the entire configuration of menu items.

Operation
Paint
Maintenance
Reference File
Triming File
System config

To display all of the menus, switch setting of the AT-95 board is required. And for details on the setup menu, refer to Section 3.

In this manual, describes the setup menu operation as follows.

Title of the selected page (top right corner display)

For reference:
When Paint→Skin Detail is selected:
MENU : Paint
PAGE : Skin Detail (P4)

Displaying Setup Menu

1. Power on the CCU and MSU.
2. Set the internal switches of the AT-95 board as follows.
   S1-1 → ON
   S1-2 → OFF
   S1-3 → ON
   S1-4 → OFF
3. DISPLAY switch/rear panel→OFF
4. POWER switch/camera power assembly→ON
5. Set the DISPLAY switch/rear panel to MENU (from OFF) while pushing up the MENU SELECT switch to ENTER. (TOP menu will be displayed.)

Note

If the power switch is turned off once, perform the above operations again to display the setup menu (steps 3 to 5).

How to change the setting values

To enter or cancel the setting value of items, which can be changed by turning the MENU SELECT knob, proceed as follows.

To enter the setting value;

Press the MENU SELECT switch to ENTER.

To cancel the setting value;

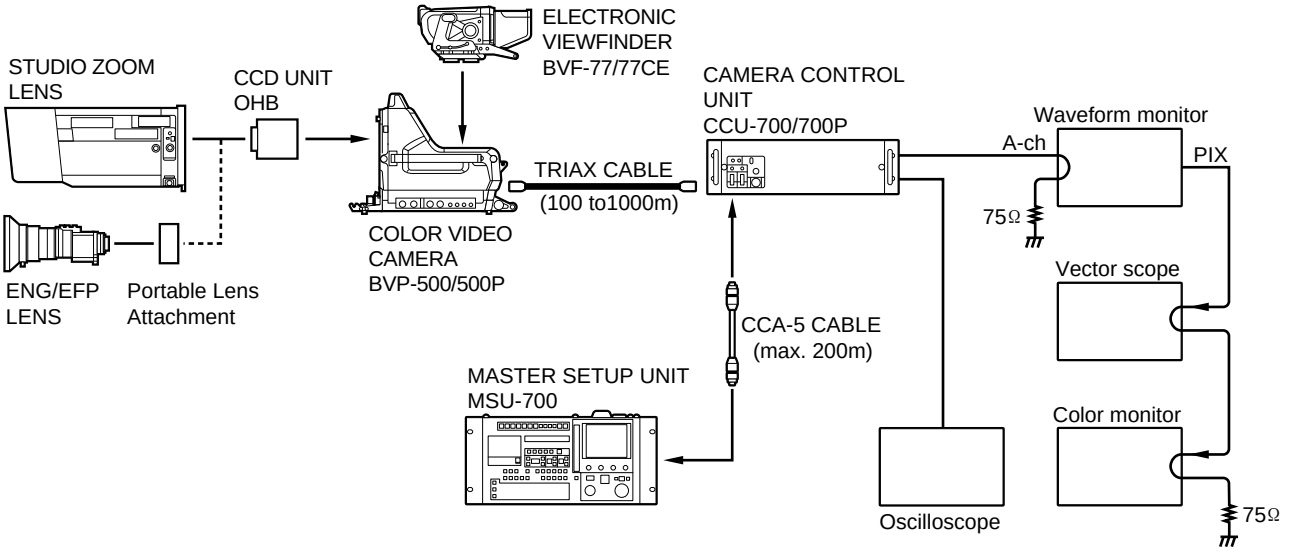
Before pressing the MENU SELECT switch to ENTER, press it to CANCEL. The original setting is restored. After pressing the MENU SELECT switch to ENTER, the setting can not be canceled.

File Store

If the adjustments in this section are suspended or the unit is powered off to extend a printed circuit board and so on, be sure to execute the FILE STORE before being powered off. (Refer to section 4-20.)

http://getMANUAL.com

4-1-4. Connection



4-1-5. Initial Settings

BVP-500/500P

Note

When switching the following switches from a customer-set position, it is recommended to record the setting state of the customer in the table below.
After adjustment is complete, be sure to return the switches to their customer-set position.

Board	Switch	Initial setting	Customer-set position
AT-95	S1-1	ON	
	S1-2	OFF	
	S1-3	ON	
	S1-4	OFF	

When adjusting a camera incorporating the OHB-500WS/WSP, be sure to set the setup menu as follows.
MENU : Operation
PAGE : Wide Screen (?4)
ITEM : 16:9/4:3 MODE→16:9

MSU-700 Operation Panel

- CAM POWER/Signal output select buttons
  ALL button → OFF (Stays out)
  CAM PW button → ON (Stays lit)
  VF PW button → ON (Stays lit)
  TEST 1 button → OFF (Stays out)
  TEST 2 button → OFF (Stays out)
  BARS button → OFF (Stays out)
  CLOSE button → ON (Stays lit)
- CAM/CCU Function ON/OFF buttons
  KNEE OFF button → OFF (Stays lit)
  DETAIL OFF button → OFF (Stays lit)
  LVL DEP OFF button → OFF (Stays lit)
  AUTO KNEE button → OFF (Stays out)
  SKIN DETAIL button → OFF (Stays out)
- Others
  GAMMA OFF button → ON(Stays out)
  MASTER GAIN button→ 0 (0 dB)
  FILTER button (ND) → 1 (Stays lit)
  FILTER button (CC) → B (Stays lit)
- Menu operation block (Touch panel)
  PAINT button →ON
  [Δ]→(Page 2/3)→ [White Clip] → [White Clip Off]

Execution of Scene File Standard

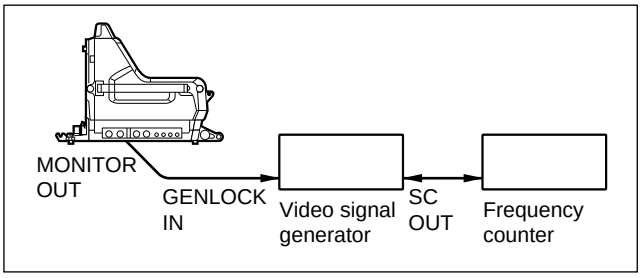
STANDARD button/MSU operation panel→ON

4-2. VCO CONT Frequency Confirmation

Notes:
- This confirmation shall be done only when the CCD unit is installed in the camera incorporating the standalone unit BKP-5910/5910P.
- This adjustment requires longer warm-up time periods (10 to 30 minutes).

Preparation:
- S650 (MONITOR SELECT)/IF-538 panel → VBS

Equipment : Frequency counter, Video signal generator
Test Point : MONITOR connector
Specifications : 3,579,545 ±10 Hz (for NTSC)
4,433,168 ±5 Hz (for PAL)



If the specification is not satisfied, perform the following adjustment.

Adjustment Procedures:
1. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
2. Set the menu as follows and adjust the frequency using the MENU SELECT knob/switch.
   MENU : System config
   PAGE : Y/Chroma (S2)
   ITEM : SC FREQ
   Specifications: 3,579,545 ±10 Hz (for NTSC)
   4,433,168 ±5 Hz (for PAL)

File Store:
Execute the OHB file store. Throw the MENU SELECT switch to ENTER to execute.
MENU : Triming File
PAGE : OHB File (T2)
ITEM : File Store

4-3. VA Gain Adjustment

Setting of Sensitivity and Standard Color Temperature:
- Use the reflective chart (reflection ratio:89.9%) in this adjustment, if possible.
- If a pattern box is used, it should be well-maintained.
- Set the luminous intensity of the chart to 2000 lx and the color temperature to 3200 K.
- This adjustment shall be performed at F7.0 or more.

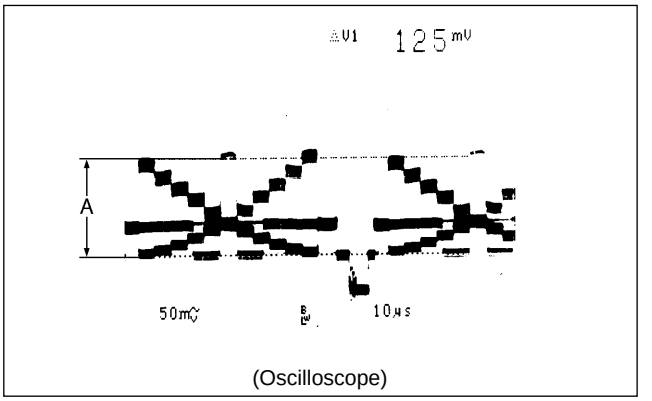
Note:
- Never change the setting of the following trimmer capacitors. These capacitors are extremely difficult to adjust in the field.
  VA-163 board : ⊘CT200, ⊘CT300, ⊘CT400

Equipment : Oscilloscope, Waveform monitor
Object : Gray scale chart

Preparations:
- MASTER GAIN button/MSU operation panel → 0 dB
- Extend the VA-163 board with the EX-464 extension board.
- S650 (MONITOR SELECT)/IF-538 panel → VBS

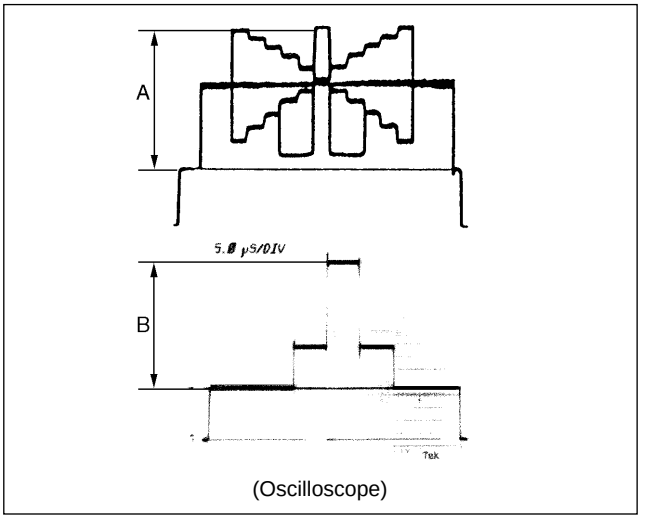
Adjustment Procedures:
1. Execute the level auto setup.
   LEVEL button/MSU operation panel → ON (Lights)
   START/BREAK button/MSU operation panel → ON (Lights)
2. TEST 2 button/MSU operation panel → ON (Lights)
3. Adjust the auto white balance.
   WHITE button/MSU operation panel → ON (Lights)
4. TEST 2 button/MSU operation panel → OFF (Goes out)
5. KNEE OFF button/MSU operation panel → OFF (Lights)
6. Close the lens iris.
7. Adjust the auto black balance.
   BLACK button/MSU operation panel → ON (Lights)
8. Confirm that the black level is 3 IRE for NTSC and 21 mV for PAL at the MONITOR connector.
   If the black level is out of specs, carry out “4-6. Master Black Adjustment”.

9. **Test Point** : TP72 (GND:TP71)/extension board (extending VA-163)
   Iris of the lens: A = 125 mV (at F7.0 or more)



(Oscilloscope)

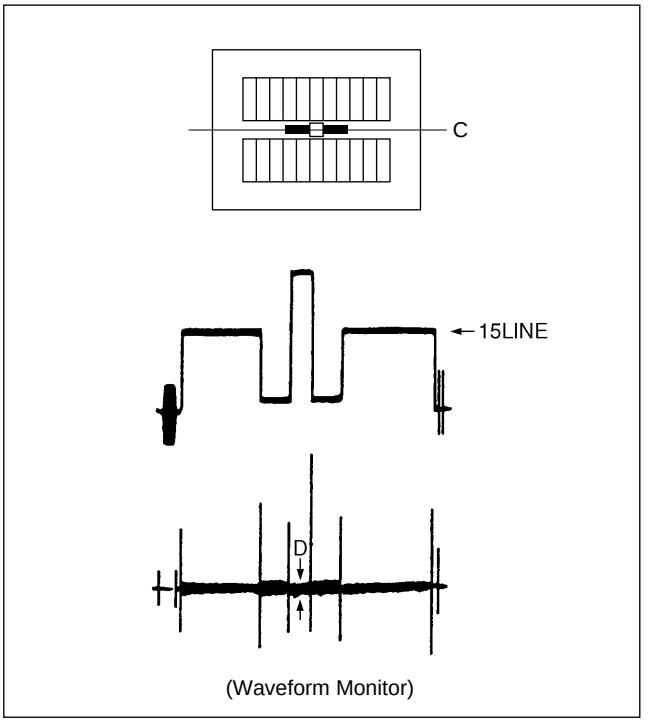
10. S650 (MONITOR SELECT)/IF-538 panel → VF G button/rear panel → ON
11. Adjust the VA gain for G.
    Test Point : MONITOR connector
    Adjustment Point : ⊘RV300 (G GAIN)/VA-163 panel
    Specifications : The levels A and B are shall be equal when the TEST 2 button/ MSU operation panel is turned on and off.
    A = B



(Oscilloscope)

12. Test 2 button/MSU operation panel → OFF
13. Select the 15 lines in the center of monitor screen C by using the 15 LINE SELECT on the waveform monitor.
14. Put the waveform monitor into the CHROMA mode.
15. S650 (MONITOR SELECT)/IF-538 panel → VBS

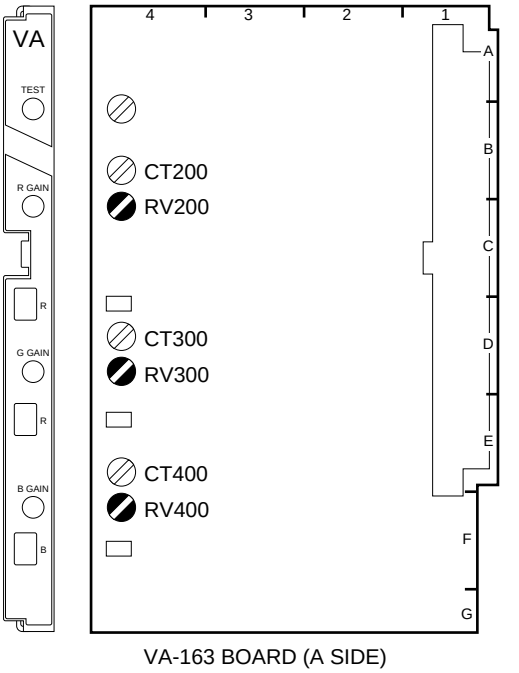
16. **Test Point** : MONITOR connector
    Adjustment Point : ⊘RV200 (R GAIN)/VA-163 panel
    ⊘RV400 (B GAIN)/VA-163 panel
    Specifications : Carrier leakage D = Minimum



(Waveform Monitor)

Resetting after Adjustment:

- S650/IF-538 panel → VBS
- G button/rear panel → OFF



VA-163 BOARD (A SIDE)

4-4. Black Shading Adjustment

Notes:

- The compensation data obtained by the black shading adjustment is not stored in the OHB File. Therefore, when the OHB is replaced or a new OHB is installed, be sure to perform this adjustment.
- If the shading adjustment is not completed, perform the adjustment again following the message displayed on the viewfinder or MSU.
  If the re-adjustment still is not completed, consult Sony service representative.

Preparations:

- Connect the waveform monitor to the MONITOR connector.
- S650 (MONITOR SELECT)/IF-538 panel → VBS

Test Point : MONITOR connector
Iris of the lens : CLOSE

Adjustment Procedures:

1. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
2. Set the menu as follows and adjust the auto black shading. Throw the MENU SELECT switch to ENTER to execute.
   MENU : Maintenance
   PAGE : Auto Setup (M4)
   ITEM : Black Shading
3. Confirm the "OK" is displayed on the viewfinder or MSU. If the error message is displayed, perform the adjustment again following this message.

Message and its meaning

BLACK:OK : Adjustment correctly completed.
LEVEL TOO HIGH : Lens closing does not operate fully, and so on.
TIME LIMIT : Black shading adjustment could not be completed within the specified number of attempts.
OVER FLOW : The difference between the reference value and the current value is too great, and exceeds adjustment range. Adjustment is then not completed.

4. Confirm the carrier level satisfies the specification on the waveform monitor.
   Specifications: Less than 2 IRE (for NTSC)
   Less than 14 mV (for PAL)

- **Manual Black Shading Adjustment (For reference)**

Note:

- Perform this adjustment only when "4-4. Black Shading Adjustment" is not completed.

Equipment : Waveform monitor

Preparations:

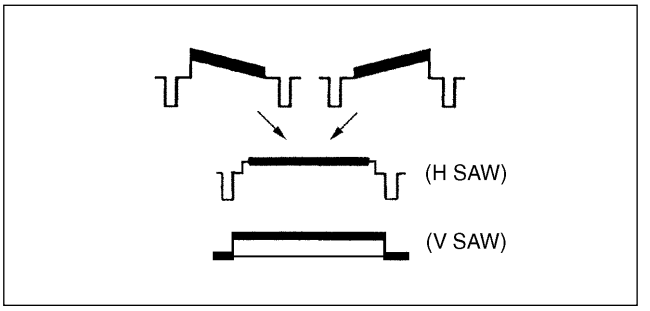
- Connect the waveform monitor to the MONITOR connector.
- S650 (MONITOR SELECT)/IF-538 panel → VF
- MASTER GAIN button/MSU operation panel → 18 dB

Test Point : MONITOR connector
Iris of the lens : CLOSE

Adjustment Procedures:

1. Set the waveform monitor as follows.
   - LUM mode
   - VOLTFULL SCALE range → 0.5
2. G button/rear panel → ON
3. Set the black level to 3 IRE for NTSC and 21 mV for PAL with the MASTER BLACK control/MSU operation panel.
4. If the shading is monitored, proceed as follows to make the waveform flat.
   MSU menu operation:
   - MAINTENANCE button → ON (Lights)
   - Touch panel operation

   Adjusting → Black Shading → G
   Adjustment items : H SAW, V SAW



5. G button/rear panel → OFF
   R button/rear panel → ON
   Adjust the R-ch black shading in the same way.

6. R button/rear panel → OFF
   B button/rear panel → ON
   Adjust the B-ch black shading in the same way.

Resetting after Adjustment:

- MASTER GAIN button/MSU operation panel → 0 dB
- S650/IF-538 panel → VBS
- R/G/B button/rear panel → OFF

4-5. White Shading Adjustment

Note:

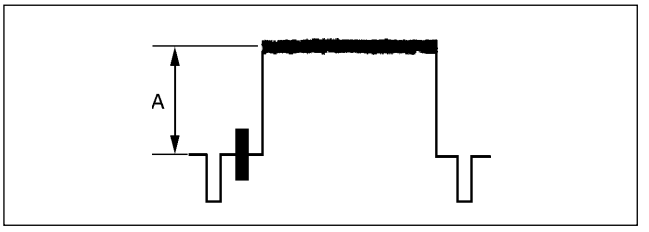
- This adjustment could not be correctly performed if the uneven white patten is used, luminance is not correct, or lens iris and lens zoom are not in good conditions.

Equipment : Waveform monitor
Test Point : MONITOR connector
Object : Full white pattern

Preparations:

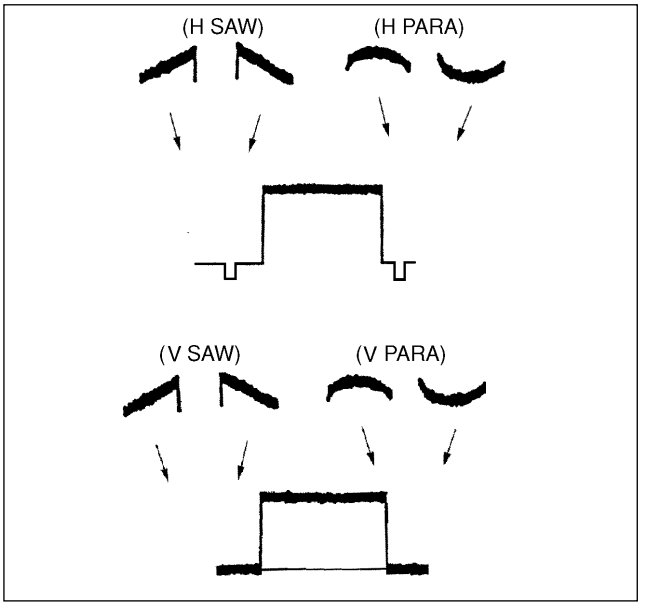
- Connect the waveform monitor to the MONITOR connector.
- S650 (MONITOR SELECT)/IF-538 panel → VBS
- KNEE OFF button/MSU operation panel → OFF (Lights)
- Shoot the fully occupied white area of the pattern box in the full underscanned monitor frame adjusting the zoom control.

Iris of the lens : A=80 ±5 IRE (for NTSC)
A = 560 ±35 mV (for PAL)



Adjustment Procedures:

1. Adjust the auto white balance.
   WHITE button/MSU operation panel → ON (Lights)
2. Set the waveform monitor as follows.
   - LUM mode
   - VOLTFULL SCALE range → 0.5
3. S650 (MONITOR SELECT)/IF-538 panel → VF
   G button/rear panel → ON
4. If the shading is monitored, proceed as follows to make the waveform flat.
   - MAINTENANCE button → ON (Lights)
   - Touch panel operation
   Adjusting → White Shading → G
   Adjustment items: H SAW, H PARA, V SAW, V PARA



5. G button/rear panel → OFF
   R button/rear panel → ON
   Adjust the R-ch white shading in the same way.
6. R button/rear panel → OFF
   B button/rear panel → ON
   Adjust the B-ch white shading in the same way.

File Store:

1. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
2. Execute the file store. Throw the MENU SELECT switch to ENTER to execute.
   Menu setting:
   MENU : Reference File
   PAGE : Reference File (R1)
   ITEM : File Store

Resetting after Adjustment:

- S650/IF-538 panel → VBS
- R/G/B button/rear panel→OFF

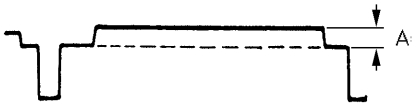
4-6. Master Black Adjustment

Equipment : Waveform monitor
Test Point : MONITOR connector

Preparations:
- Connect the waveform monitor to the MONITOR connector.
- S650 (MONITOR SELECT)/IF-538 panel → VF
- G button/rear panel → ON

Iris of the lens : CLOSE

Adjustment Procedures:
1. Set the waveform monitor as follows
   - LUM mode
2. **Adjustment Point** : MASTER BLACK control/ MSU operation panel
   Specifications : A = 3 ±1 IRE (for NTSC)
   A = 21 ±7 mV (for PAL)



(Waveform Monitor)

3. Adjust the auto black balance.
   BLACK button/MSU operation panel → ON (Lights)

File Store:
1. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
2. Execute the file store. Throw the MENU SELECT switch to ENTER to execute.
   Menu setting:
   MENU : Reference File
   PAGE : Reference File (R1)
   ITEM : File Store

Resetting after Adjustment:
- S650 (MONITOR SELECT)/IF-538 panel → VBS
- G button/rear panel → OFF

4-7. Gamma Correction Adjustment

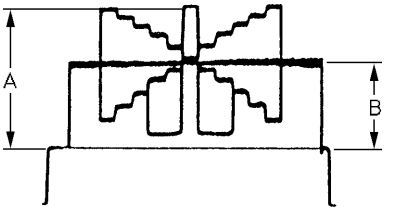
Equipment : Waveform monitor, Vectorscope
Test Point : MONITOR connector
Object : Grayscale chart

Preparations:
- Connect the waveform monitor to the MONITOR connector.
- Connect the waveform monitor to the PIX OUT terminal of the vectorscope.
- KNEE OFF button/MSU operation panel → OFF (Lights)
- GAMMA OFF button/MSU operation panel → ON (Stays out)
- S650 (MONITOR SELECT)/IF-538 panel → VBS
- Shoot the grayscale chart so that the chart frame is aligned with the underscanned monitor frame.

Iris of the lens : A = 100 ±2 IRE (for NTSC)
A = 700 ±14 mV (for PAL)

Adjustment Procedures:
1. S650 (MONITOR SELECT)/IF-538 panel → VF
   G button/rear panel → ON
2. Adjust the master gamma. Proceed as follows.
   MSU menu operation:
   - PAINT button → ON (Lights)
   - Touch panel operation

   [Δ] → (Page 2/3) → [Gamma]
   Adjustment item : Master
   Specifications : B = 55.5 ±2.0 IRE (for NTSC)
   B = 420 ±14 mV (for PAL)



(Waveform Monitor)

3. Close the lens iris.
4. TEST 1 button/MSU operation panel → ON (Lights)
   S650 (MONITOR SELECT)/IF-538 panel → VBS
5. Adjust the auto white balance.
   WHITE button/MSU operation panel → ON (Lights)

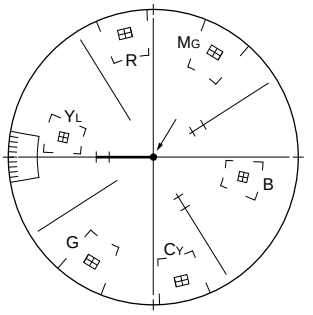
6. Adjust the R gamma. Proceed as follows.
   MSU menu operation:
   - PAINT button → ON (Lights)
   - Touch panel operation

   Δ → (Page 2/3) → Gamma
   Adjustment item : R
   Specifications : Center the beam spot on the vectorscope.

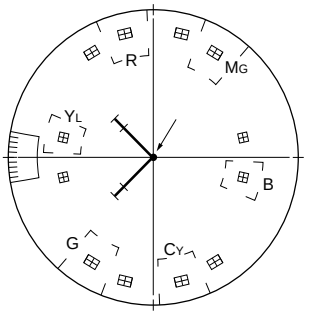
7. Adjust the B gamma. Proceed as follows.
   MSU menu operation:
   - PAINT button → ON (Lights)
   - Touch panel operation

   Δ → (Page 2/3) → Gamma
   Adjustment item : B
   Specifications : Center the beam spot on the vectorscope.

8. Repeat the steps 6 and 7 alternately, until the beam spot is minimized on the vectorscope.



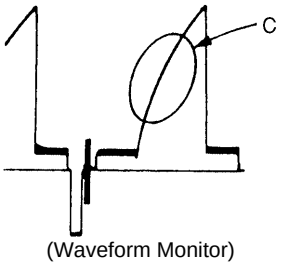
(For NTSC)



(For PAL)

(Vectorscope)

9. Confirm that the carrier leakage does not observed at portion C on the waveform monitor.
   Specifications : C = Minimum



(Waveform Monitor)

Resetting after Adjustment:
- TEST 1 button/MSU operation panel → OFF (Goes out)
- G button/rear panel → ON

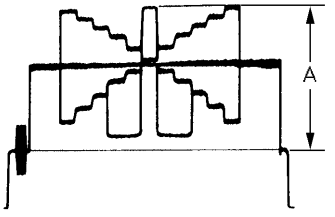
4-8. Flare Adjustment

Equipment : Waveform monitor
Test Point : MONITOR connector
Object : Grayscale chart

Preparations:

- Connect the waveform monitor to the MONITOR connector.
- KNEE OFF button/MSU operation panel → OFF (Lights)
- S650 (MONITOR SELECT)/IF-538 panel → VBS
- Shoot the grayscale chart so that the chart frame is aligned with the underscanned monitor frame.

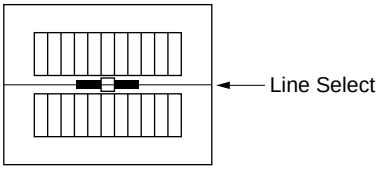
Iris of the Lens : A = 100 ±2 IRE (for NTSC)
A = 700 ±14 mV (for PAL)



(Waveform Monitor)

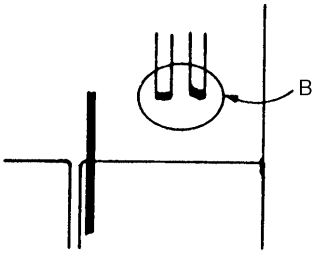
Adjustment Procedures:

1. Adjust the auto white balance.
   WHITE button/MSU operation panel → ON (Lights)
2. Open the iris control of the lens by two stops against the reference setup (corresponding to the above A).
3. S650 (MONITOR SELECT)/IF-538 panel → VF
   G button/rear panel → ON
4. Select the 15 lines in the center of the monitor screen by using the 15 LINE SELECT on the waveform monitor.



(Waveform Monitor)

5. **MSU menu operation:**
   - PAINT button → ON (Lights)
   - Touch panel operation
   (Page 1/3) → Flare → Flare Off (Reversed)
   Confirm that the level at portion B does not fluctuate even if the flare is turned on/off.
6. If fluctuates, adjust the G flare as follows.
   - Touch panel operation
     Turn the flare on. (Flare Off is not reversed.)
   Adjustment item : G
7. S650 (MONITOR SELECT)/IF-538 panel → VBS
8. Adjust the R flare.
   Adjustment item : R
   Specifications : Minimize the carrier leakage.
9. Adjust the B flare.
   Adjustment item : B
   Specifications : Minimize the carrier leakage.



(Waveform Monitor)

10. Repeat the steps 8 and 9 alternately, until the carrier leakage is minimized.

File Store:

1. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
2. Execute the file store. Throw the MENU SELECT switch to ENTER to execute.
   Menu setting:
   MENU : Reference File
   PAGE : Reference File (R1)
   ITEM : File Store

Resetting after Adjustment:

- G button/rear panel → OFF

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4-9. Knee and White Clip Adjustment

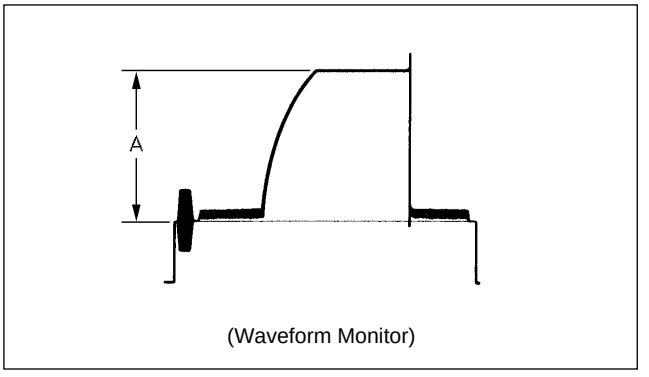
Note:
Perform this adjustment, if necessary, to suit the customer's preferences.

Equipment : Waveform monitor
Test Point : MONITOR connector

Preparations:
- Connect the waveform monitor to the MONITOR connector.
- S650 (MONITOR SELECT)/IF-538 panel → VBS
- KNEE OFF button/MSU operation panel → ON (goes out)
- MASTER GAIN button/MSU operation panel → 9 dB

Adjustment Procedures:
1. Confirm that the black level is 3 IRE for NTSC and 21 mV for PAL.
2. Adjust the auto black balance.
   BLACK button/MSU operation panel → ON (Lights)
3. TEST 1 button/MSU operation panel → ON (Lights)
4. Adjust the knee point. Proceed as follows.
   MSU menu operation:
   - PAINT button → ON (Lights)
   - Touch panel operation

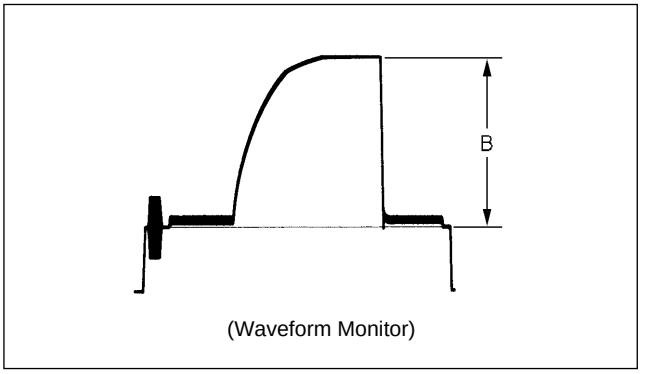
   [Δ] → (Page 2/3) → [White Clip] → [White Clip Off] (Reversed)
   (Page 2/3) → [Knee Point] → [Knee Max]
   Adjustment item : Master
   Specifications : A = 98 ±2 IRE (for NTSC)
   A = 686 ±10 mV (for PAL)



(Waveform Monitor)

5. Adjust the knee slope. Proceed as follows.
   MSU menu operation:
   - PAINT button → ON (Lights)
   - Touch panel operation

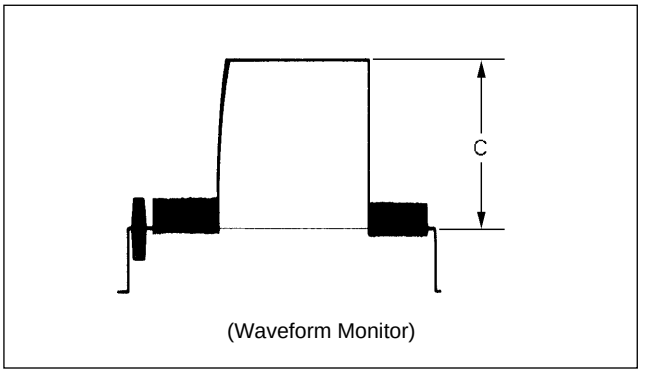
   (Page 2/3) → [Knee Point]
   Turn off the knee max. ([Knee Max] is not reversed.)
   (Page 2/3) → [Knee Slope]
   Adjustment item : Master
   Specifications : B = 109 ±2 IRE (for NTSC)
   B = 763 ±10 mV (for PAL)



(Waveform Monitor)

6. MASTER GAIN button/MSU operation panel → 18 dB
7. Adjust the white clip. Proceed as follows.
   MSU menu operation:
   - PAINT button → ON (Lights)
   - Touch panel operation

   (Page 2/3) → [White clip]
   Turn on the white clip. ([White Clip Off] is not reveresed.)
   Adjustment item : Master
   Specifications : C = 109 ±2 IRE (for NTSC)
   C = 750 ±10 mV (for PAL)



(Waveform Monitor)

Resetting after Adjustment:
- TEST 1 button/MSU operation panel → OFF (Goes out)
- MASTER GAIN button/MSU operation panel → 0 dB

Note:

The values used in the above adjustments are under the conditions that the white clip level is set to 109 IRE (for NTSC) or 763 mV (for PAL).

When the white clip level is set to other value than 109 IRE or 763 mV, use the following table to set the levels of the knee point and knee slope.

	White Clip Level (Unit: IRE/mV)			
	109/763	107/749	105/735	103/721
Knee point	98/686	98/686	96/672	96/672
Knee slope	109/763	109/763	107/750	107/750
White clip	109/763	107/749	105/735	103/721

4-10. Crispening Adjustment

Note:

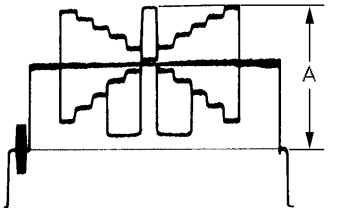
Perform this adjustment, if necessary, to suit the customer's preferences.

Equipment : Waveform monitor
Test Point : MONITOR connector
Object : Grayscale chart

Preparations:

- Connect the waveform monitor to the MONITOR connector.
- DETAIL OFF button/MSU operation panel → ON (goes out)
- S650 (MONITOR SELECT)/IF-538 panel → VBS
- Shoot the grayscale chart so that the chart frame is aligned with the underscanned monitor frame.

Iris of the lens : A = 90 ±2 IRE (for NTSC)
A = 630 ±14 mV (for PAL)



(Waveform Monitor)

Adjustment Procedures:

1. Adjust the auto white balance.
   WHITE button/MSU operation panel → ON (Lights)
2. Adjust the crispening. Proceed as follows.
   MSU menu operation:
   - PAINT button → ON (Lights)
   - Touch panel operation

   (Page 1/3) → Detail → Detail1

   Adjustment item : Crispening
   Specifications : Set the numeral value to -99 once, and turn slowly for increment until the noise at the black level of the waveform is just decreased, or an appropriate crispening level is obtained.

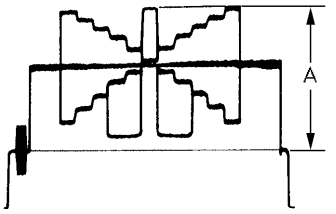
4-11. Level Dependent Adjustment

Note:
Perform this adjustment, if necessary, to suit the customer's preferences.

Equipment : Waveform monitor
Test Point : MONITOR connector
Object : Grayscale chart

Preparations:
- Connect the waveform monitor to the MONITOR connector.
- Shoot the grayscale chart so that the chart frame is aligned with the underscanned monitor frame.
- S650 (MONITOR SELECT)/IF-538 panel → VBS
- DETAIL OFF button/MSU operation panel → ON (Goes out)
- LVL DEP OFF button/MSU operation panel → ON (Goes out)

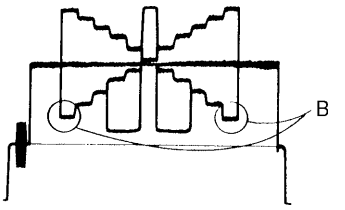
Adjustment Procedures:
1. **Iris of the lens**: A = 90 ±2 IRE (for NTSC)
   A = 630 ±14 mV (for PAL)



(Waveform Monitor)

2. **MSU menu operation:**
   - PAINT button → ON (Lights)
   - Touch panel operation

   (Page 1/3) → Detail → Detail1
   Adjustment item : Level Dep
   Specifications :Set the numeral value to -99 once, and turn slowly for increment until spikes at portions B are just decreased.



(Waveform Monitor)

Note:
- After adjustment is complete, be sure to perform "4-13. H/V Ratio Adjustment" and "4-14. Detail Level Adjustment.

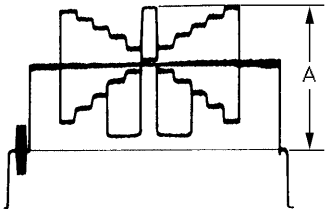
4-12. Detail Frequency Adjustment

Note:
Perform this adjustment, if necessary, to suit the customer's preferences.

Equipment : Waveform monitor
Test Point : MONITOR connector
Object : Grayscale chart

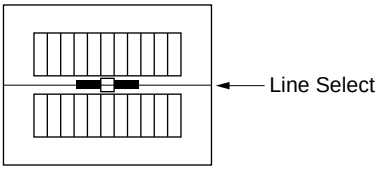
Preparations:
- Connect the waveform monitor to the MONITOR connector.
- Shoot the grayscale chart so that the chart frame is aligned with the underscanned monitor frame.
- S650 (MONITOR SELECT)/IF-538 panel → VBS
- KNEE OFF button/MSU operation panel → OFF (Lights)
- DETAIL OFF button/MSU operation panel → ON (Goes out)

Adjustment Procedures:
1. **Iris of the lens:** A = 90 ±2 IRE (for NTSC)
   A = 630 ±14 mV (for PAL)



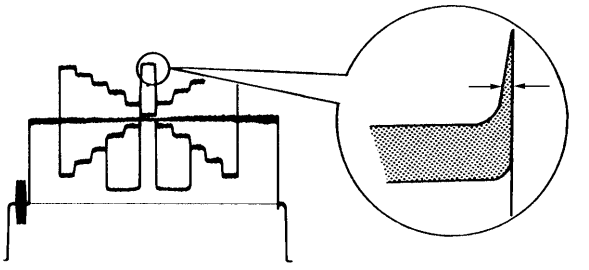
(Waveform Monitor)

2. Adjust the auto white balance.
   WHITE button/MSU operation panel → ON (Lights)
3. Make a selection of line at the center white portion of the grayscale chart.



(Waveform Monitor)

4. **MSU menu operation:**
   - PAINT button → ON (Lights)
   - Touch panel operation
   (Page 1/3) → Detail → Detail2
   Adjustment item : Frequency
   Specifications : Adjust the edge width at each end of the center white portion for the desired width.


(Waveform Monitor)

Note:
- After adjustment is complete, be sure to perform "4-13. H/V Ratio Adjustment" and "4-14. Detail Level Adjustment.

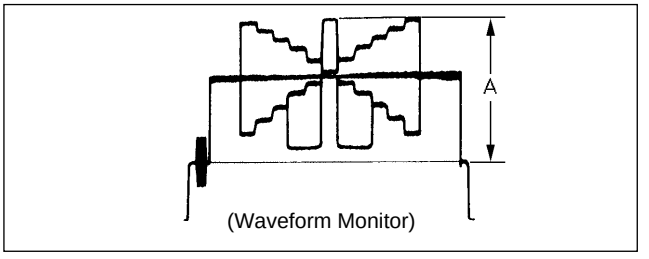
4-13. H/V Ratio Adjustment

Note:
Perform this adjustment, if necessary, to suit the customer's preferences.

Equipment : Waveform monitor
Test Point : MONITOR connector
Object : Grayscale chart

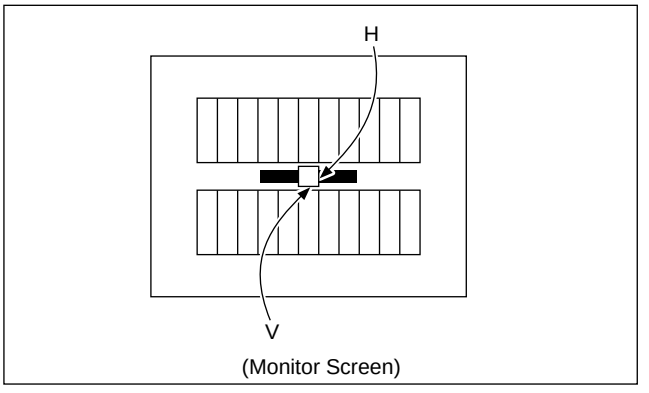
Preparations:
- Connect the waveform monitor to the MONITOR connector.
- Shoot the grayscale chart so that the chart frame is aligned with the underscanned monitor frame.
- S650 (MONITOR SELECT)/IF-538 panel → VBS
- KNEE OFF button/MSU operation panel → OFF (Lights)
- DETAIL OFF button/MSU operation panel → ON (Goes out)

Adjustment Procedures:
1. **Iris of the lens** : A = 90 ±2 IRE (for NTSC)
   A= 630 ±14 mV (for PAL)



2. **MSU menu operation:**
   - PAINT button → ON (Lights)
   - Touch panel operation

   (Page 1/3) → Detail → Detail2
   Adjustment item : H/V Ratio
   Specifications : The ratio between the H and V detail amounts (white) to be added shall be 1 : 1.



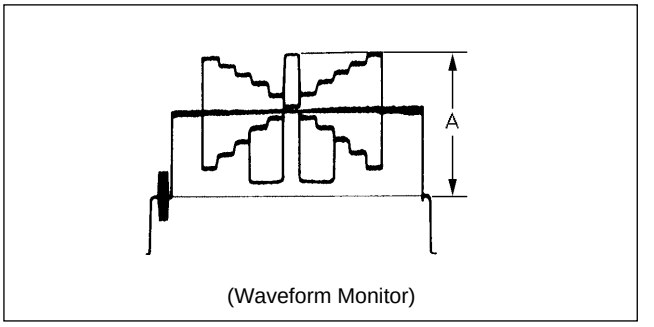
4-14. Detail Level Adjustment

Note:
Perform this adjustment, if necessary, to suit the customer's preferences.

Equipment : Waveform monitor
Test Point : MONITOR connector
Object : Grayscale chart

Preparations:
- Connect the waveform monitor to the MONITOR connector.
- Shoot the grayscale chart so that the chart frame is aligned with the underscanned monitor frame.
- S650 (MONITOR SELECT)/IF-538 panel → VBS
- DETAIL OFF button/MSU operation panel → ON (Goes out)

Adjustment Procedures:
1. **Iris of the lens** : A = 90 ±2 IRE (for NTSC)
   A = 630 ±14 mV (for PAL)



2. Adjust the auto white balance.
   WHITE button/MSU operation panel → ON (Lights)
3. **MSU menu operation:**
   - PAINT button → ON (Lights)
   - Touch panel operation

   (Page 1/3) → Detail → Detail1
   Adjustment item : Level
   Specifications : Adjust the detail signal level to be added to each step in the grayscale chart for the desired level.

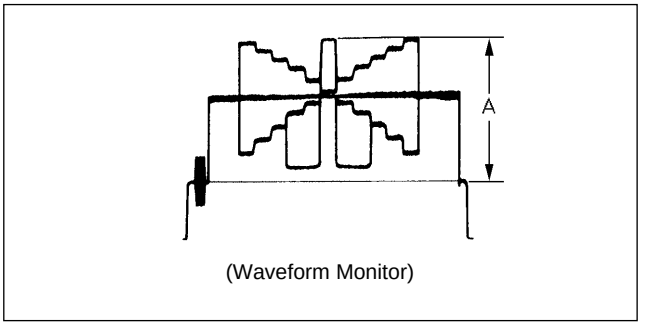
4-15. Detail Clip Adjustment

Note:
Perform this adjustment, if necessary, to suit the customer's preferences.

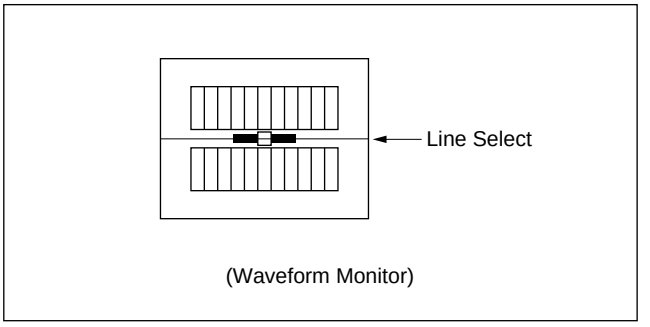
Equipment : Waveform monitor
Test Point : MONITOR connector
Object : Grayscale chart

Preparations:
- Connect the waveform monitor to the MONITOR connector.
- Shoot the grayscale chart so that the chart frame is aligned with the underscanned monitor frame.
- S650 (MONITOR SELECT)/IF-538 panel → VBS
- KNEE OFF button/MSU operation panel → OFF (Lights)
- DETAIL OFF button/MSU operation panel → ON (Goes out)

Adjustment Procedures:
1. **Iris of the lens**: A = 90 ±2 IRE (for NTSC)
   A = 630 ±14 mV (for PAL)

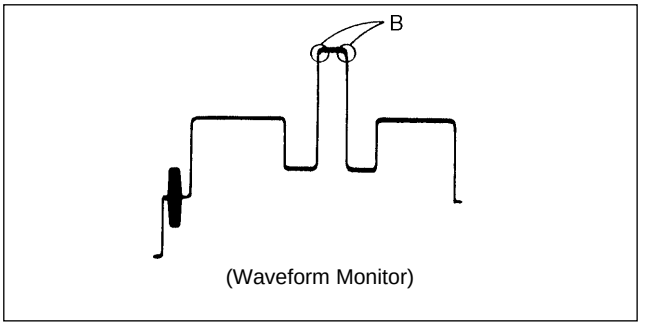


2. Adjust the auto white balance.
   WHITE button/MSU operation panel → ON (Lights)
3. Make a selection of line at the center white portion of the grayscale chart.



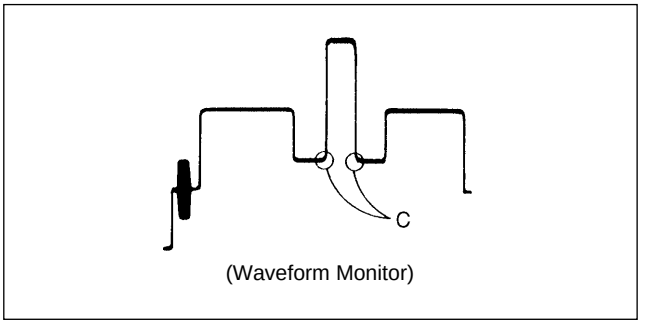
4. Adjust the white limiter. Proceed as follows.
   MSU menu operation:
   - PAINT button → ON (Lights)
   - Touch panel operation

   (Page 1/3) → Detail → Detail3
   Adjustment item : W.Limiter
   Specifications : Adjust the edges of portions B for the desired clip level.



5. Adjust the black limiter. Proceed as follows.
   MSU menu operation:
   - PAINT button → ON (Lights)
   - Touch panel operation

   (Page 1/3) → Detail → Detail3
   Adjustment item : B.Limiter
   Specifications : Adjust the edges of portions C for the desired clip level.



4-16. Skin Tone Adjustment

Note:

Perform this adjustment, if necessary, to suit the customer's preferences.

Equipment : Color monitor, Viewfinder or Vectorscope

Preparations:

- Connect the vectorscope or color monitor to the PIX 2 OUTPUT connector of CCU.
- Shoot a person's face.
- S650 (MONITOR SELECT)/IF-538 panel → VBS
- SKIN DETAIL button/MSU operation panel → ON (Lights)
- DETAIL GATE button/MSU operation panel → ON (Lights)

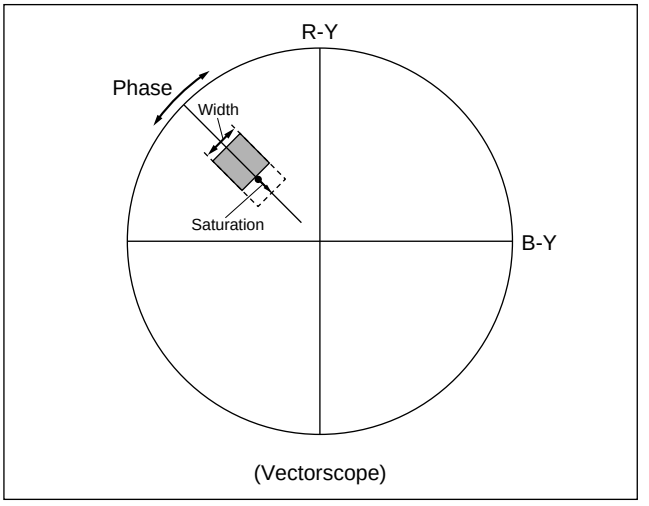
Adjustment Procedures:

1. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
2. Set the menu as follows.
   MENU : Paint
   PAGE : Skin Detail (P4)
   ITEM : Gate → On
3. Adjust the skin detail according to customer's preferences.

   MSU menu operation:

   - PAINT button → ON (Lights)
   - Touch panel operation
     (Page 1/3) → Skin Detail

     Adjustment items : Level, Phase, Saturation, Width
     Level : Detail level within the skin gate
     Phase : Hue
     Saturation : Component in the saturation direction
     Width : Component in the hue direction



(Vectorscope)

Resetting after Adjustment:

- DETAIL GATE button/MSU operation panel → OFF (Goes out)
- Set the menu as follows.
  MENU : Paint
  PAGE : Skin Detail (P4)
  ITEM : Gate → Off

4-17. Zebra Adjustment

Note:

Perform this adjustment, if necessary, to suit the customer's preferences.

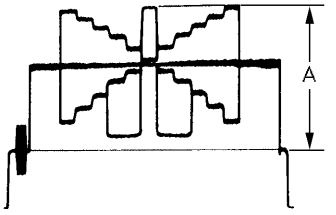
Equipment : Waveform monitor
Test Point : MONITOR connector
Object : Grayscale chart

Preparations:

- Connect the waveform monitor to the MONITOR connector.
- KNEE OFF button/MSU operation panel→ OFF (Lights)
- S650 (MONITOR SELECT)/IF-538 panel → VBS
- Shoot the grayscale chart so that the chart frame is aligned with the underscanned monitor frame.

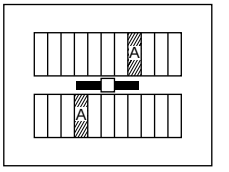
Adjustment Procedures:

1. Adjust the auto white balance.
   WHITE button/MSU operation panel → ON (Lights)
2. **Iris of the lens**: A = 100 ±2 IRE (for NTSC)
   A = 700 ±14 mV (for PAL)



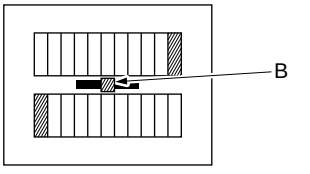
(Waveform Monitor)

3. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
4. Set the menu as follows.
   MENU : System config
   PAGE : Pre knee/Zebra (S4)
   ITEM : Z.Disp → 1
5. Adjust the zebra 1 using the MENU SELECT knob/switch. Proceed as follows.
   ITEM : Zebra1 [LEVEL]
   Specifications: Adjust that the stripes appear at the center of the portions A on the viewfinder screen.
   (The area of the stripes can be changed by
   ITEM: Zebla 1 [RANGE].)



(Viewfinder Screen)

6. Set the menu as follows.
   MENU : System config
   PAGE : Pre knee/Zebra (S4)
   ITEM : Z.Disp → 2
7. Adjust the zebra 2 using the MENU SELECT knob/switch. Proceed as follows.
   ITEM : Zebra2 [LEVEL]
   Specifications: Adjust that the stripes appear at the center of the portions B on the viewfinder screen.



(Viewfinder Screen)

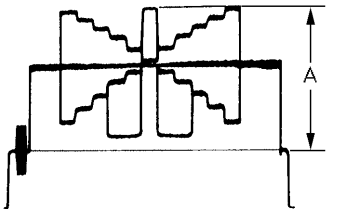
4-18. Auto Iris Adjustment

Note:
Perform this adjustment, if necessary, to suit the customer's preferences.

Equipment : Waveform monitor
Test Point : MONITOR connector
Object : Grayscale chart

Preparations:
- IRIS AUTO button/MSU operation panel → ON (Lights)
- KNEE OFF button/MSU operation panel → OFF (Lights)
- Connect the waveform monitor to the MONITOR connector.
- S650 (MONITOR SELECT)/IF-538 panel → VBS
- Shoot the grayscale chart so that the chart frame is aligned with the underscanned monitor frame.

Adjustment Procedures:
1. Adjust the auto white balance.
   WHITE button/MSU operation panel → ON (Lights)
2. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
3. Set the menu as follows and adjust the APL ratio using the MENU SELECT knob/switch.
   MENU : Operation
   PAGE : Auto Iris/Auto Knee (?6)
   ITEM : APL Ratio
   Specifications : Adjust the operation mode depending on the application.
   Note : Automatic iris operation mode setting can be done from the average level to peak-to-peak level of the video signal.
   99 → average level
   -99 → peak-to-peak level
4. Set the menu as follows.
   MENU : Operation
   PAGE : Auto Iris/Auto Knee (?6)
   ITEM : Iris Override→Off
5. Adjust the auto iris level using MENU SELECT knob/switch.
   MENU : System config
   PAGE : Iris (S6)
   ITEM : Level
   Specifications: A = 100 ±2 IRE (for NTSC)
   A = 700 ±14 mV (for PAL)



(Waveform Monitor)

4-19. Settings After Finishing Adjustment

DETAIL OFF button/MSU operation panel → ON (Goes out)
GAMMA OFF button/MSU operation panel → ON (Goes out)
KNEE OFF button/MSU operation panel → ON (Goes out)

4-20. File Store

Be sure to execute the file store after any one of the adjustments of Sections 4-2 through 4-18 is performed.

Procedures:

1. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
2. Execute the reference file store. Throw the MENU SELECT switch to ENTER to execute.
   Menu Setting:
   MENU : Reference File
   PAGE : Reference File (R1)
   ITEM : File Store
3. Execute the triming file store. Throw the MENU SELECT switch to ENTER to execute.
   Menu Setting:
   MENU : Triming File
   PAGE : Triming File (T1)
   ITEM : File Store

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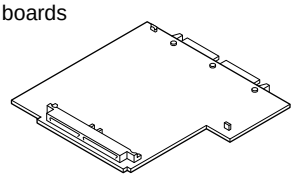
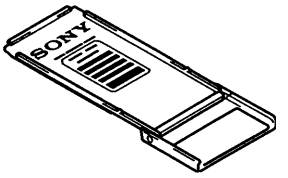
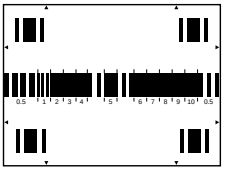
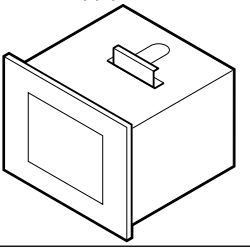
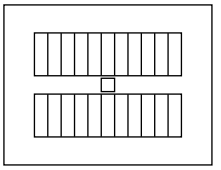
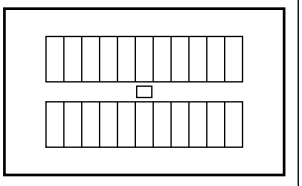
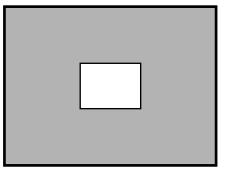
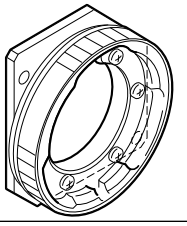
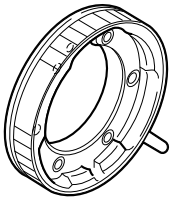
Section 5
Overall Electrical Alignment

5-1. Preparation

5-1-1. Equipment Required

Extension board EX-464	Extension board BKP-7900 (Option)
Sony P/N: J-6395-040-A For BVP-500/500P plug-in boards 	For CCU-700/700P plug-in boards 
Multiburst Chart	**Pattern box PTB-500**
Sony P/N: J-6026-110-A 	**Sony P/N: J-6029-140-B** • Light source for test chart Power supply AC90 to 240V 
Grayscale Chart	**Grayscale Chart (16:9)**
Sony P/N: J-6026-130-B 	**Sony P/N: J-6394-080-A** 
White Window Chart	**Portable Lens Attachement**
Make a square hole at the center of a black sheet of paper. 	**Sony P/N: J-6395-080-A** For OHB-400 series 
Portable Lens Attachement	
Sony P/N: J-6395-090-A For OHB-500/500WS series 	

Measuring Equipment

- DC variable power supply
- Frequency counter
  Advantest TR5821AK or equivalent
- Spectrum analyzer
- Audio analyzer
  Tektronix AA501A (OP, 02)or equivalent
- Audio generator
  Tektronix SG-5010 or equivalent
- Oscilloscope
  Tektronix 2465 or equivalent
- Waveform monitor/Vectorscope
  Tektronix 1750 or equivalent (for NTSC)
  Tektronix 1751 or equivalent (for PAL)
- Digital voltmeter
  Advantest TR6845 or equivalent
- Video signal generator
  Tektronix 1410 or equivalent (for NTSC)
  Tektronix 1411 or equivalent (for PAL)
- Color monitor
  Sony BVM-1911/2811 or equivalent (for NTSC)
  Sony BVM-2011P/3011P or equivalent (for PAL)

Peripheral Equipment

- CCD unit : OHB-400/500/500WS series
- Camera control unit : CCU-700/700P/700A/700AP
- Master setup unit : MSU-700
- TRIAX cable (Standard length: 150 m)

5-1-2. Notes on Adjustment

- All measuring equipment shall be calibrated.
- Also the alignment for the OHB-400/500/500WS (or their PAL version), CCU-700/700P/700A/700AP, and MSU-700 shall be completed.
- To connect each equipment, refer to Section 5-1-4.
- As for initial settings before beginning adjustment, refer to Section 5-1-5.
- Be sure to turn off the power switch on the power assembly of the camera before disconnecting the printed circuit boards.

  Note

  Allow for about ten seconds until the unit is energized when turning this switch off and then on momentarily.
- About ten-minute warm-up time is allowed before beginning adjustment.
- Use a plastic (or ceramic) core driver to adjust ⊘LV, ⊘FL, ⊘T and so on.
- When using the camera as 16:9 mode together with the OHB-500WS/500WSP, use the specified grayscale chart (J-6394-080-A).
- Paste a black colored velvets (around 3 × 3 cm) to both sides of the full white portion in the center of the grayscale chart. (For more details, consult your Sony service representative.)

5-1-3. Description of Setup Menu

A part of adjustments given in this section uses the setup menu. The setup menu consists of the following menus. Besides there is a TOP menu indicating the entire configuration of menu items.

Operation
Paint
Maintenance
Reference File
Triming File
System config

To display all of the menus, switch setting of the AT-95 board is required. And for details on the setup menu, refer to Section 3.

In this manual, describes the setup menu operation as follows.

Title of the selected page (top right corner display)

For reference:
When Paint→Skin Detail is selected:

MENU : Paint
PAGE : Skin Detail (P4)

Displaying Setup Menu

1. Power on the CCU and MSU.
2. Set the internal switches of the AT-95 board as follows.
   S1-1 → ON
   S1-2 → OFF
   S1-3 → ON
   S1-4 → OFF
3. DISPLAY switch/rear panel→OFF
4. POWER switch/camera power assembly→ON
5. Set the DISPLAY switch/rear panel to MENU (from OFF) while pushing up the MENU SELECT switch to ENTER. (TOP menu will be displayed.)

Note

If the power switch is turned off once, perform the above operations again to display the setup menu (steps 3 to 5).

How to change the setting values

To enter or cancel the setting value of items, which can be changed by turning the MENU SELECT knob, proceed as follows.

To enter the setting value;

Press the MENU SELECT switch to ENTER.

To cancel the setting value;

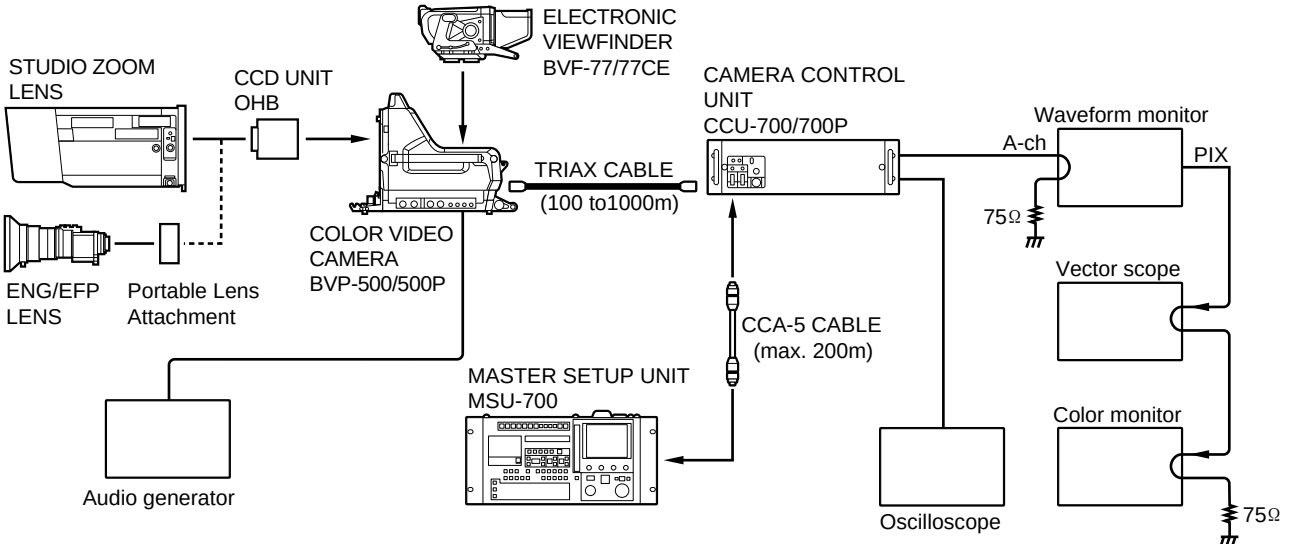
Before pressing the MENU SELECT switch to ENTER, press it to CANCEL. The original setting is restored.
After pressing the MENU SELECT switch to ENTER, the setting can not be canceled.

File Store

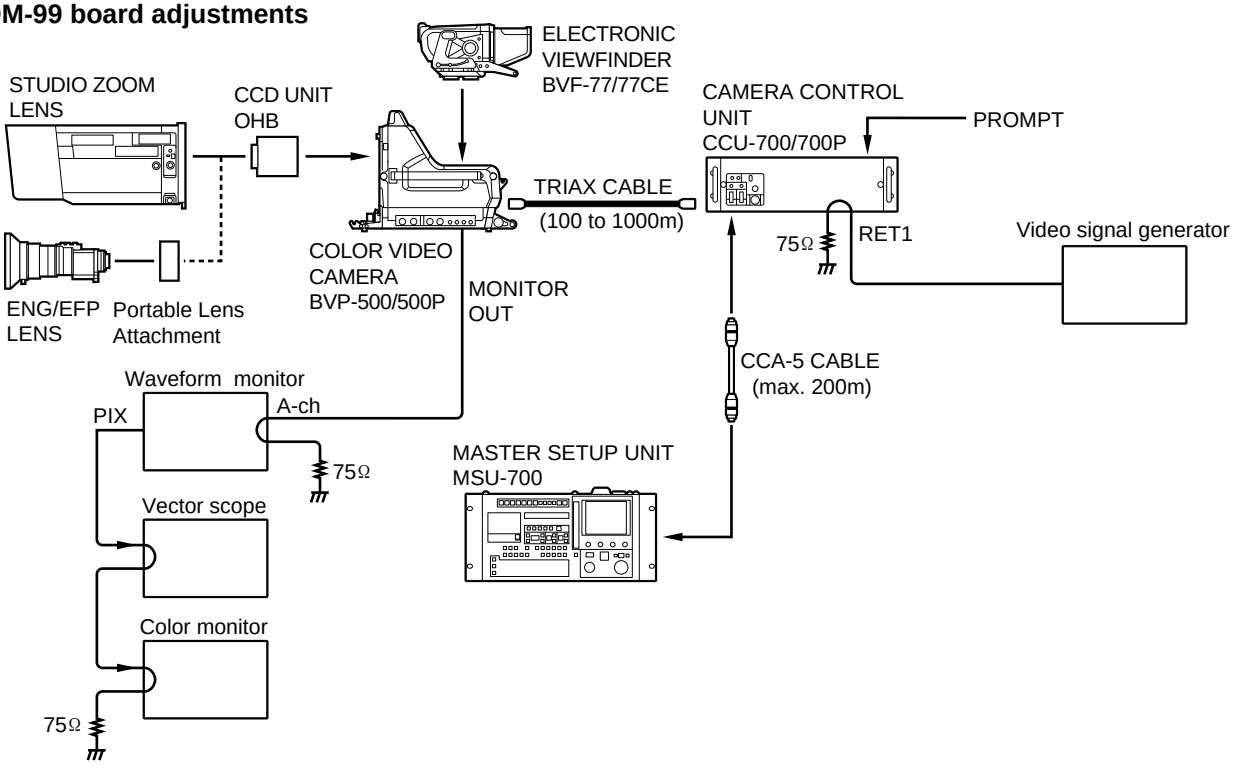
If the adjustments in this section are suspended or the unit is powered off to extend a printed circuit board and so on, be sure to execute the FILE STORE before being powered off.
This section provides instructions to store the setting data on the reference or triming file in every adjustment item. This intends to prevent the data from being cleared when powered off.
As the data is kept held unless powered off, however, more than one data can be stored at a time. The file store may not be necessarily executed for every adjustment item.

5-1-4. Connection

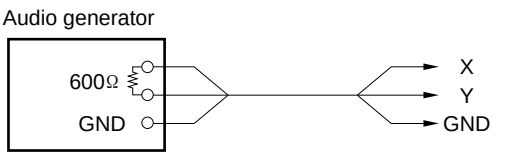
For general adjustments



For DM-99 board adjustments



For audio adjustments



5-1-5. Initial Settings

BVP-500/500P

Note

When switching the following switches from a customer-set position, it is recommended to record the setting state of the customer in the table below.
After adjustment is complete, be sure to return the switches to their customer-set position.

Board	Switch	Initial setting	Customer-set position
AT-95	S1-1	ON	
	S1-2	OFF	
	S1-3	ON	
	S1-4	OFF	
IF-538	S200	RET	
	S650	VBS	
MD-103	S3	PROMPT	
AU-211	SW1	C (CARBON)	
	SW2-1	OFF	
	SW2-2	OFF	
	SW2-3	OFF	
	SW2-4	OFF	
	SW2-5	ON	
	SW2-6	OFF	
	SW2-7	OFF	
	SW2-8	OFF	
	SW3-1	OFF	
	SW3-2	ON	
	SW4	OFF	
	SW5	PHANTOM	
	SW6	MIC1	
AU-215	S200	0 (0 dBu)	
DM-98	S1-1	OFF	
	S1-2	OFF	
	S1-3	OFF	
	S1-4	ON	

When adjusting a camera incorporating the OHB-500WS/WSP, be sure to set the setup menu as follows.
MENU : Operation
PAGE : Wide Screen (?4)
ITEM : 16:9/4:3 MODE→16:9

MSU-700 Operation Panel

- CAM POWER/Signal output select buttons
  ALL button → OFF (Stays out)
  CAM PW button → ON (Stays lit)
  VF PW button → ON (Stays lit)
  TEST 1 button → OFF (Stays out)
  TEST 2 button → OFF (Stays out)
  BARS button → OFF (Stays out)
  CLOSE button → ON (Stays lit)
- CAM/CCU Function ON/OFF buttons
  KNEE OFF button → OFF (Stays lit)
  DETAIL OFF button → OFF (Stays lit)
  LVL DEP OFF button → OFF (Stays lit)
  AUTO KNEE button → OFF (Stays out)
  SKIN DETAIL button → OFF (Stays out)
- Others
  GAMMA OFF button → ON(Stays out)
  MASTER GAIN button→ 0 (0 dB)
  FILTER button (ND) → 1 (Stays lit)
  FILTER button (CC) → B (Stays lit)
- Menu operation block (Touch panel)
  PAINT button →ON
  [Δ]→(Page 2/3)→ [White Clip] → [White Clip Off]

Preset of Compensation Data

When a board was replaced or repaired, preset the compensation data, proceeding as follows. If the data is preset once, be sure to carry out all steps of 5-2 thruogh 5-22. Because presetting clears all adjustment data of video and detail system.

1. Execute the reference file clear.
   Throw the MENU SELECT switch to ENTER to execute.
   MENU : Reference File
   PAGE : Reference File (R1)
   ITEM : Clear File
2. Execute the scene file standard.
   STANDARD button/MSU operation panel→ON

5-2. VCO CONT Frequency Adjustment

Notes:

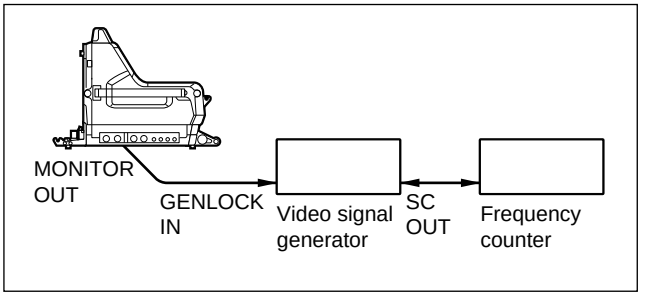
- This adjustment shall be performed only when the CCD unit is installed in the camera incorporating the standalone unit BKP-5910/5910P.
- This adjustment requires longer warm-up time periods (10 to 30 minutes).

Equipment : Frequency counter,
Video signal generator

Test Point : MONITOR connector

Preparation:

- S650 (MONITOR SELECT)/IF-538 panel → VBS



Adjustment Procedures:

1. Set the DISPLAY switch/rear panel to MENU while pushing up the MONITOR SELECT switch to ENTER.
2. Set the menu as follows and adjust the frequency using the MENU SELECT knob/switch.
   MENU : System config
   PAGE : Y/Chroma (S2)
   ITEM : SC FREQ
   Specifications : 3,579,545 ±10 Hz (for NTSC)
   4,433,168 ±5 Hz (for PAL)

File Store:

Execute the OHB file store. Throw the MENU SELECT switch to ENTER to execute.

MENU : Triming File
PAGE : OHB File (T2)
ITEM : File Store

5-3. CCU Y Adjustment

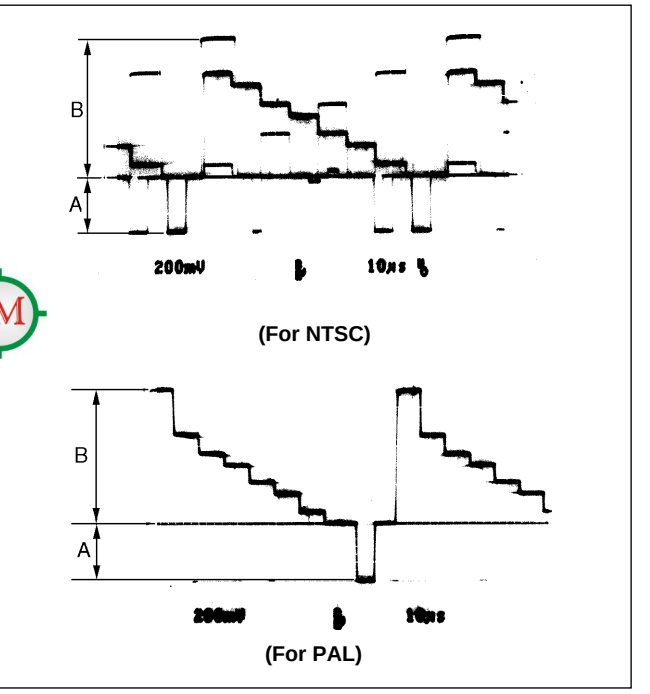
Equipment : Oscilloscope
Test Point : TP3(Y)/DA-88 panel

Preparations:

• S650 (MONITOR SELECT)/IF-538 panel → VBS

Adjustment Procedures:

1. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
2. Set the menu as follows.
   MENU : System config
   PAGE : Y/Chroma (S2)
   ITEM : CB → On
3. Set the menu as follows and adjust the Y sync using the MENU SELECT knob/switch.
   Adjustment Point:
   MENU : System config
   PAGE : Y/Chroma (S2)
   ITEM : Y SYNC
   Specifications: A = 303 ±2 mV (for NTSC)
   A = 300 ±2 mV (for PAL)
4. Set the menu as follows and adjust the Y video using the MENU SELECT knob/switch.
   Adjustment Point:
   MENU : System config
   PAGE : Y/Chroma (S2)
   ITEM : Y Video
   Specifications: B = 700 ±2 mV



(20MHz B/W LIMIT → ON)

File Store:

Execute the file store. Throw the MENU SELECT switch to ENTER to execute.
MENU : Triming File
PAGE : Triming File (T1)
ITEM : File Store

5-4. Monitor Out Adjustment

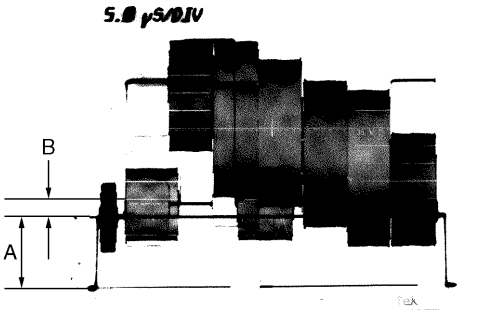
Equipment : Waveform monitor
Test Point : MONITOR connector

Preparations:

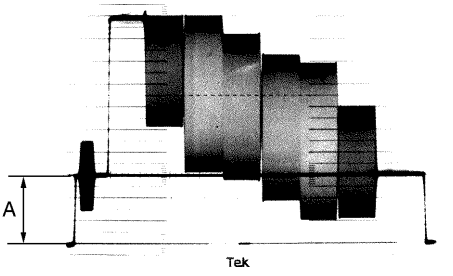
- Connect the waveform monitor to the MONITOR connector.
- S650 (MONITOR SELECT)/IF-538 panel → VBS

Adjustment Procedures:

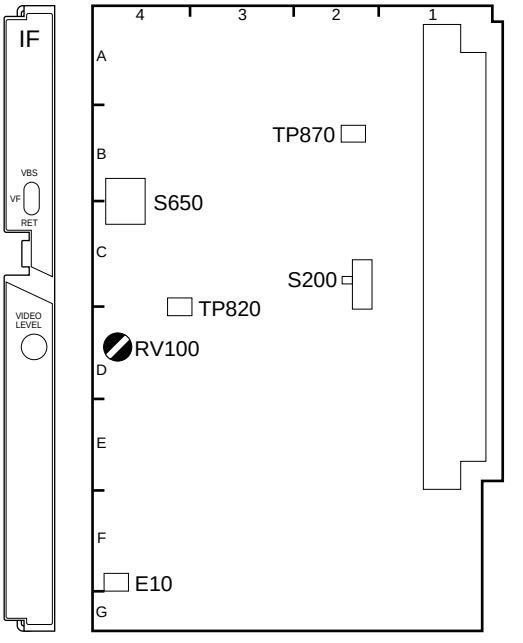
1. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
2. Set the menu as follows.
   MENU : System config
   PAGE : Y/Chroma (S2)
   ITEM : CB → On
3. **Adjustment Point** : ⊘RV100 (VIDEO LEVEL)/ IF-538 panel
   Specifications : A = 40 ±1 IRE (for NTSC)
   A = 300 ±2 mV (for PAL)
4. Adjust the test setup. (NTSC only)
   Adjustment Point :
   MENU : System config
   PAGE : Y/Chroma (S2)
   ITEM : TEST SETUP
   Specifications : B = 7.5 ±1 IRE
   File Store:
   Execute the file store. Throw the MENU SELECT switch to ENTER to execute.
   MENU : Triming File
   PAGE : Triming File (T1)
   ITEM : File Store



(For NTSC)



(For PAL)



IF-538 BOARD (A SIDE)

5-5. Chroma Adjustment

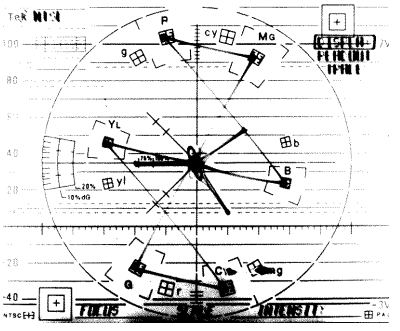
Equipment : Waveform monitor, Vectorscope
Test Point : MONITOR connector

Preparations:

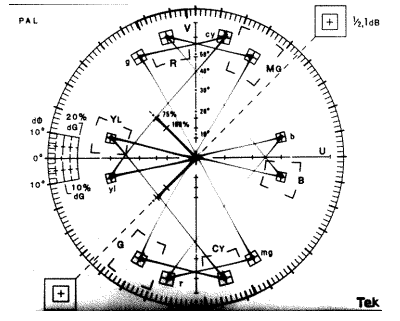
- Connect the vectorscope to the MONITOR connector.
- S650 (MONITOR SELECT)/IF-538 panel → VBS

Adjustment procedures:

1. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
2. Set the menu as follows.
   MENU : System config
   PAGE : Y/Chroma (S2)
   ITEM : CB → On
3. Set the menu as follows.
   Adjustment Point:
   MENU : System config
   PAGE : Y/Chroma (S2)
   ITEM : Chroma LVL
   ITEM : Q/V LVL
   Specifications: Adjust the items “Chroma LVL” and “Q/V LVL” alternately using the MENU SELECT knob/switch so that the beam spots are positioned inside the corresponding frames on the vectorscope.

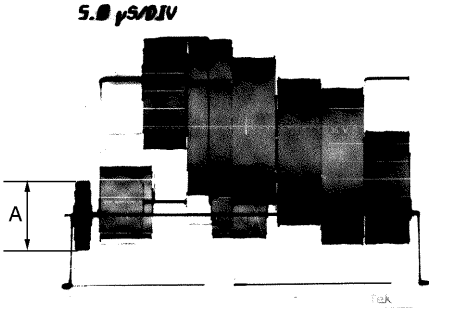


(For NTSC)

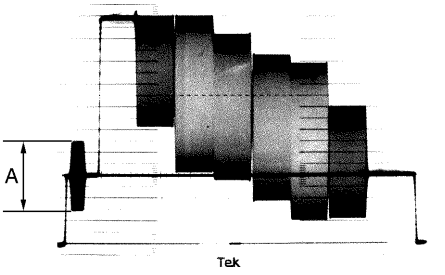


(For PAL)

4. Connect the waveform monitor to the MONITOR connector.
5. **Adjustment Point**:
   MENU : System config
   PAGE : Y/Chroma (S2)
   ITEM : Burst LVL
   Specifications: A = 40 ±1 IRE (for NTSC)
   A = 300 ±5 mV (for PAL)



(For NTSC)



(For PAL)

File Store:

Execute the file store. Throw the MENU SELECT switch to ENTER to execute.

MENU : Triming File
PAGE : Triming File (T1)
ITEM : File Store

5-6. INT SC Phase Adjustment

Notes:

This adjustment precedures are stated below assuming that where the Tektronix 1750 (for BVP-500) or 1751 (for BVP-500P) is used.
If any other measuring instrument is used, follow the instructions given in the operation manual attached to it.

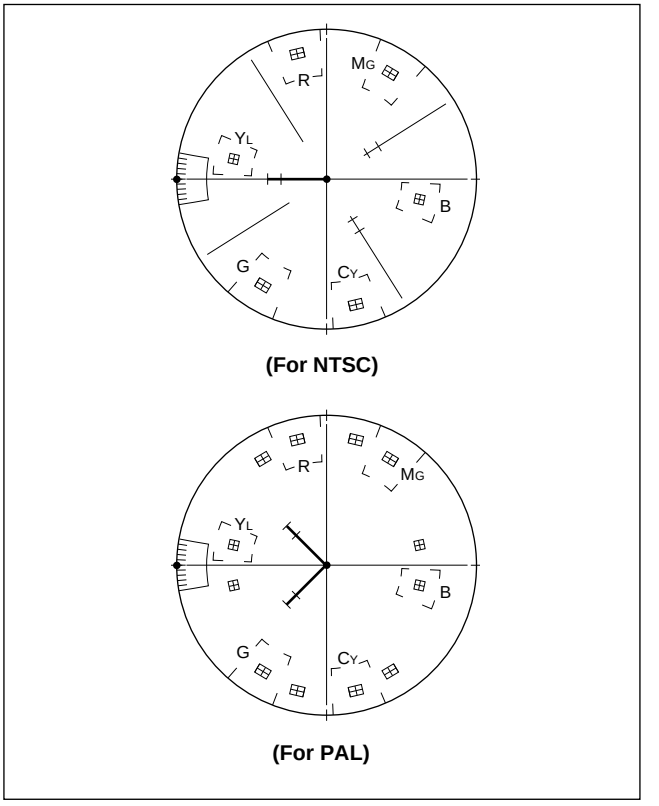
Equipment : Vectorscope (SC-H Phase measuring mode)
Test Point : MONITOR connector

Preparations:

- Connect the vectorscope to the MONITOR connector.
- S650 (MONITOR SELECT)/IF-538 panel → VBS

Adjustment Procedures:

1. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
2. Set the menu as follows.
   MENU : System config
   PAGE : Y/Chroma (S2)
   ITEM : CB → On
3. Set the menu as follows and adjust the SC-H phase using the MENU SELECT knob/switch
   Adjustment Point:
   MENU : System config
   PAGE : Y/CHROMA (S2)
   ITEM : SC-H Phase
   Specifications: Position the luminous line of the burst (SC) and the beam spot of H as shown in the figure.



File Store:

Execute the file store. Throw the MENU SELECT switch to ENTER to execute.
MENU : Triming File
PAGE : Triming File (T1)
ITEM : File Store

5-7. VF Level Adjustment

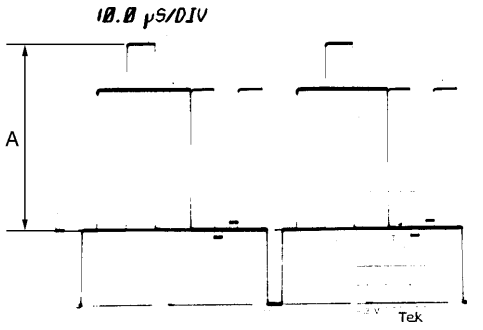
Equipment : Waveform monitor
Test Point : MONITOR connector

Preparations:

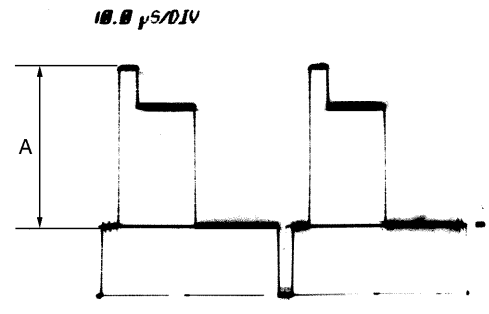
- Connect the waveform monitor to the MONITOR connector.
- S650 (MONITOR SELECT)/IF-538 panel → VF
- G button/rear panel → ON

Adjustment Procedures:

1. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
2. Set the menu as follows.
   MENU : System config
   PAGE : Y/Chroma (S2)
   ITEM : CB → On
3. Set the menu as follows and adjust the REG level using the MENU SELECT knob/switch.
   Adjustment Point:
   MENU : System config
   PAGE : Y/CHROMA (S2)
   ITEM : REG LVL
   Specifications: Y Level A = 92.5 ±2.0 IRE (for NTSC)
   A = 700 ±14 mV (for PAL)



(For NTSC)



(For PAL)

File Store:

Execute the file store. Throw the MENU SELECT switch to ENTER to execute.
MENU : Triming File
PAGE : Triming File (T1)
ITEM : File Store

Resetting after Adjustment :

- S650/IF-538 panel → VBS
- G button/rear panel → OFF

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5-8. TEST 1 Adjustment

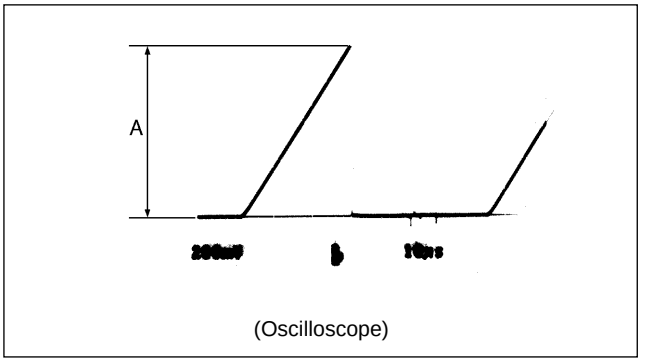
Equipment : Oscilloscope

Preparations:

- Extend the VA-163 board with the EX-464 extension board.

Adjustment Procedures:

1. Execute the level auto setup.
   LEVEL button/MSU operation panel → ON (Lights)
   START/BREAK button/MSU operation panel → ON (Lights)
2. TEST 1 button/MSU operation panel → ON (Lights)
3. Adjust the G signal level.
   Test Point : TP52 (GND: GND(A))/extension board (extending VA-163)
   Adjustment Point : ⊘RV50 (TEST)/VA-163 panel
   Specifications : A = 880 ±2 mV



(Oscilloscope)

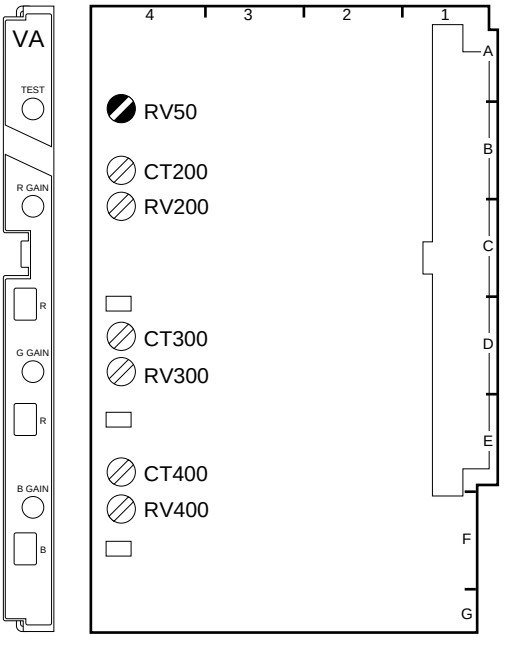
4. Adjust the white level for R.
   Test Point : TP54 (GND: GND(A))/extension board (extending VA-163)
   MSU menu operation:
   - PAINT button → ON (Lights)
   - Touch panel operation
     (Page 1/3) → White

   Adjustment Item : R
   Specifications : A = 880 ±40 mV
5. Adjust the white level for B.
   Test Point : TP50 (GND: GND(A))/extension board (extending VA-163)
   MSU menu operation:
   - PAINT button → ON (Lights)
   - Touch panel operation
     (Page 1/3) → White

   Adjustment Item : B
   Specifications : A = 880 ±40 mV

Resetting after Adjustment:

TEST 1 button/MSU operation panel → OFF (Goes out)



VA-163 BOARD (A SIDE)

5-9. TEST 2 Adjustment

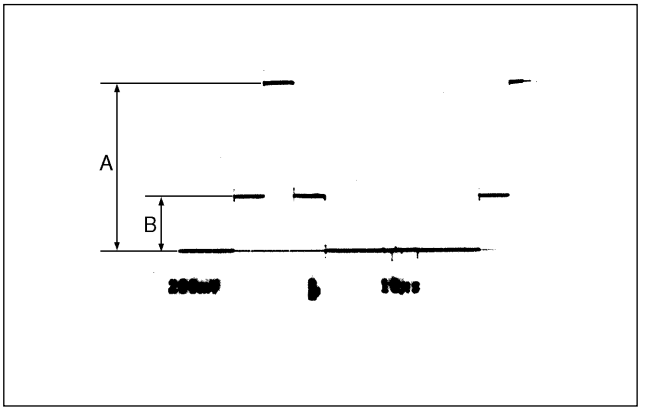
Equipment : Oscilloscope
Test Point : TP52 (GND: GND(A))/extension board (extending VA-163)

Preparations:

- Extend the VA-163 board with the EX-464 extension board.
- TEST 2 button/MSU operation panel → ON (Lights)

Adjustment Procedures:

1. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
2. Adjust the TEST2 high level.
   Adjustment Point:
   MENU : System config
   PAGE : PR/VA/TEST (S3)
   ITEM : TEST2 HI
   Specifications: A = 880 ±5 mV
3. Adjust the TEST2 middle level.
   Adjustment Point:
   MENU : System config
   PAGE : PR/VA/TEST (S3)
   ITEM : TEST2 MID
   Specifications: B = 290 ±5 mV



File Store:

Execute the file store. Throw the MENU SELECT switch to ENTER to execute.

MENU : Triming File
PAGE : Triming File (T1)
ITEM : File Store

Resetting after Adjustment:

- TEST 2 button/MSU operation panel → OFF (Goes out)

5-10. A/D Gain Adjustment

Equipment : Waveform monitor
Test Point : MONITOR connector

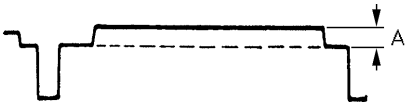
Preparations:

- Connect the waveform monitor to the MONITOR connector.
- MASTER GAIN button/MSU operation panel → 0 dB
- KNEE OFF button/MSU operation panel → OFF (Lights)
- DETAIL OFF button/MSU operation panel → OFF (Lights)
- GAMMA OFF button/MSU operation panel → ON (Stays out)
- MSU menu operation (Touch panel)
  PAINT button → ON
  [Δ] → (Page 2/3) → [WhiteClip] → [White Clip Off] (Reversed)
- S650 (MONITOR SELECT)/IF-538 panel → VF
- G button/rear panel → ON

Iris of the lens : CLOSE

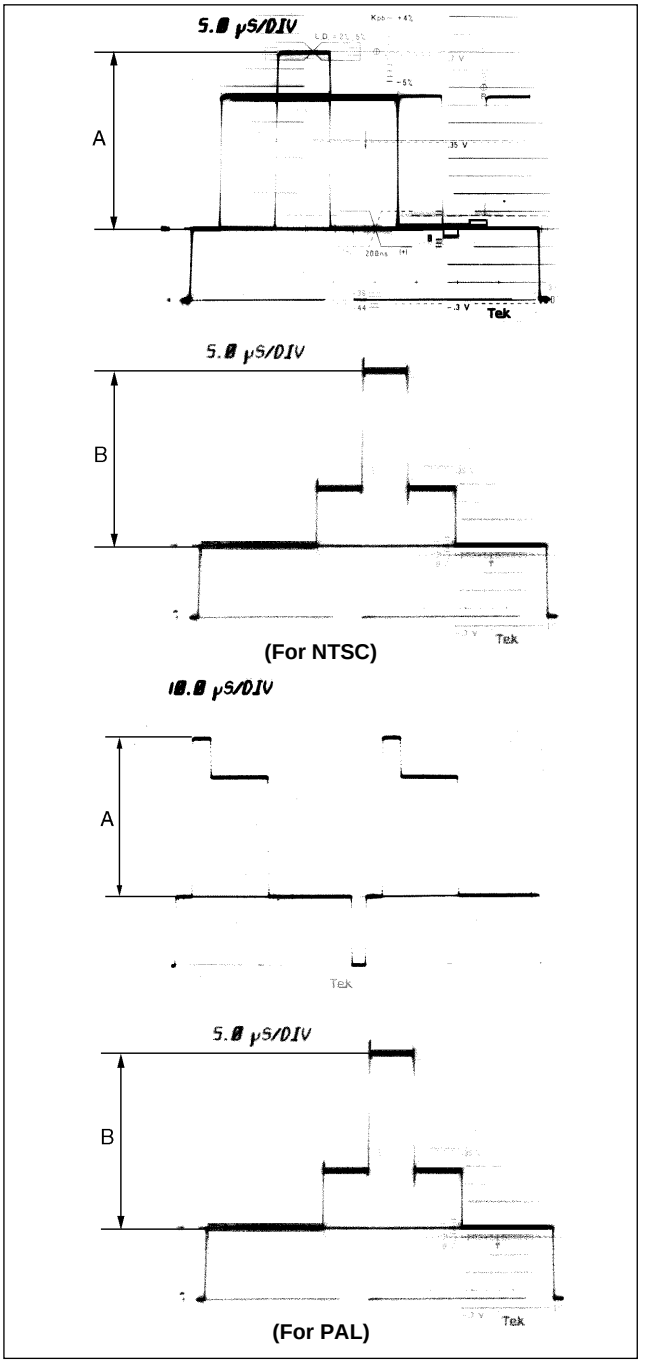
Adjustment Procedures

1. Set the waveform monitor as follows.
   • LUM mode
2. Adjust the master black.
   Adjustment Point : MASTER BLACK control/ MSU operation panel
   Specifications : A = 3 ±1 IRE (for NTSC)
   A = 21 ±7 mV (for PAL)



(Waveform Monitor)

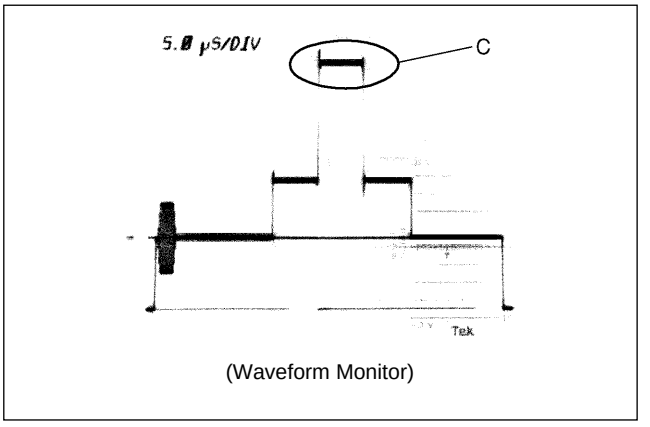
3. Adjust the auto black balance.
   BLACK button/MSU operation panel → ON (Lights)
4. TEST 2 button/MSU operation panel → ON (Lights)
5. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
6. Set the menu as follows and adjust the A/D gain for G using the MENU SELECT knob/switch.
   Adjustment Point:
   MENU : System config
   PAGE : PR/VA/TEST (S3)
   ITEM : PR AD G [G]
   Specifications: The levels A and B shall be equal when the color-bar signal is turned on by setting the menu as follows.
   MENU : System config
   PAGE : Y/Chroma (S2)
   ITEM : CB → On



(For NTSC)

(For PAL)

7. S650 (MONITOR SELECT)/IF-538 panel → VBS G button/rear panel → OFF
   TEST 2 button/MSU operation panel → ON (Lights)
8. Set the menu as follows.
   MENU : System config
   PAGE : Y/Chroma (S2)
   ITEM : CB → Off
9. Adjust the A/D gain for R using the MENU SELECT knob/switch.
   Adjustment Point:
   MENU : System config
   PAGE : PR/VA/TEST (S3)
   ITEM : PR AD G [R]
   Specifications : Minimize the carrier leakage.
   C = Minimum
10. Adjust the A/D gain for B using the MENU SELECT knob/switch.
   Adjustment Point:
   MENU : System config
   PAGE : PR/VA/TEST (S3)
   ITEM : PR AD G [B]
   Specifications : Minimize the carrier leakage.
   C = Minimum



(Waveform Monitor)

11. Repeat the steps 9 and 10 alternately until the specifications are satisfied.

File Store:

Execute the file store. Throw the MENU SELECT switch to ENTER to execute.

MENU : Triming File
PAGE : Triming File (T1)
ITEM : File Store

Resetting after Adjustment:

- DETAIL OFF button → OFF (Lights)
- TEST 2 button → OFF (Goes out)

5-11. VA Gain Adjustment

Setting of Sensitivity and Standard Color Temperature:

- Use the reflective chart (reflection ratio:89.9%) in this adjustment, if possible.
- If a pattern box is used, it should be well-maintained.
- Set the luminouse intensity of the chart to 2000 lx and the color temperature to 3200 K.
- This adjustment shall be performed at F7.0 or more.

Note:

- Never change the setting of the following trimmer capacitors. These capacitors are extremely difficult to adjust in the field.
  VA-163 board : ⊘CT200, ⊘CT300, ⊘CT400

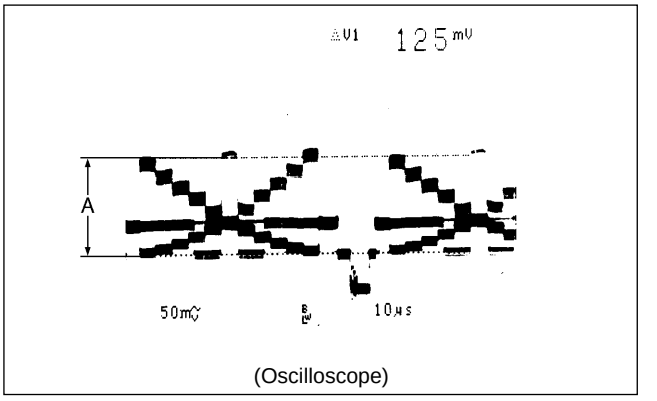
Equipment : Oscilloscope, Waveform monitor
Object : Gray scale chart

Preparations:

- MASTER GAIN button/MSU operation panel → 0 dB
- Extend the VA-163 board with the EX-464 extension board.
- S650 (MONITOR SELECT)/IF-538 panel → VBS

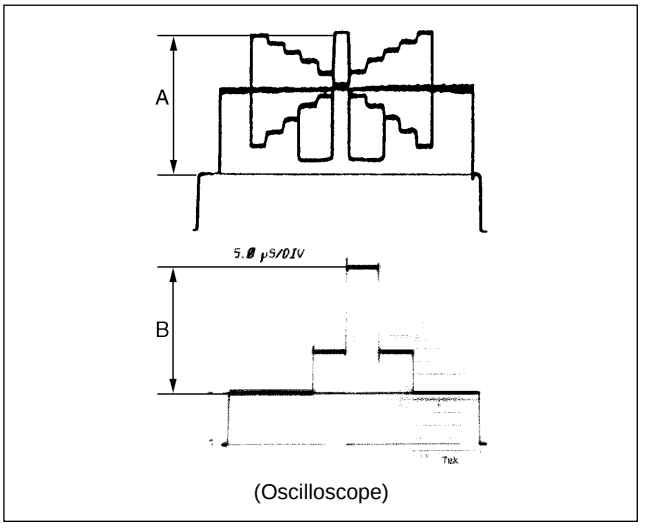
Adjustment Procedures:

1. Execute the level auto setup.
   LEVEL button/MSU operation panel → ON (Lights)
   START/BREAK button/MSU operation panel → ON (Lights)
2. TEST 2 button/MSU operation panel → ON (Lights)
3. Adjust the auto white balance.
   WHITE button/MSU operation panel → ON (Lights)
4. TEST 2 button/MSU operation panel → OFF (Goes out)
5. KNEE OFF button/MSU operation panel → OFF (Lights)
6. Close the lens iris.
7. Adjust the auto black balance.
   BLACK button/MSU operation panel → ON (Lights)
8. Confirm that the black level is 3 IRE for NTSC and 21 mV for PAL at the MONITOR for connector.
   If the black level is out of specs, carry out "5-15. Master Black Adjustment".
9. **Test Point** : TP72 (GND:TP71)/extension board (extending VA-163)
   Iris of the lens: A = 125 mV (at F7.0 or more)



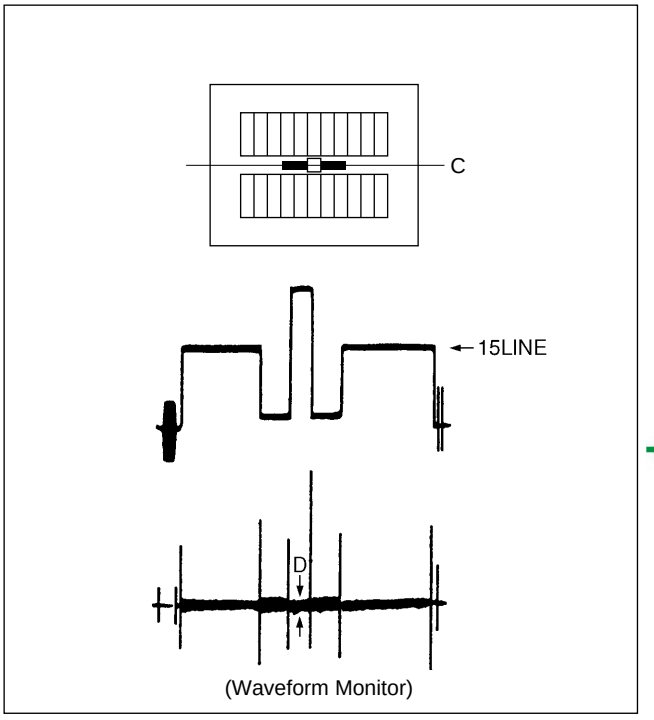
(Oscilloscope)

10. S650 (MONITOR SELECT)/IF-538 panel → VF.
    G button/rear panel → ON
11. Adjust the VA gain for G.
    Test Point : MONITOR connector
    Adjustment Point : ⊘RV300 (G GAIN)/VA-163 panel
    Specifications : The levels A and B are shall be equal when the TEST 2 button/ MSU operation panel is turned on and off.
    A = B



(Oscilloscope)

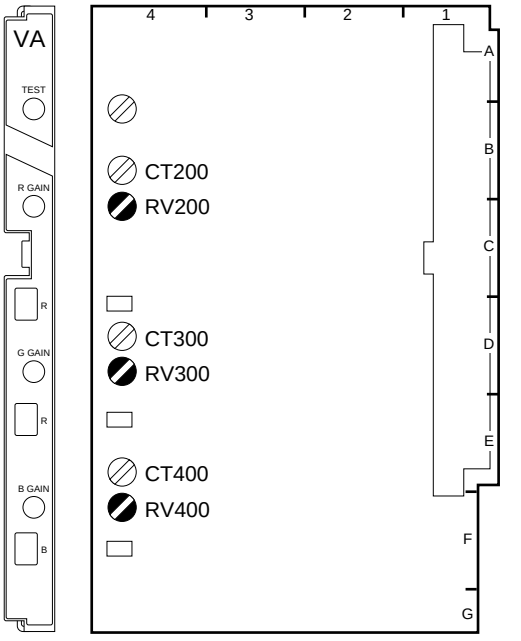
12. Test 2 bottun/MSU operation panel → OFF
13. Select the 15 lines in the center of monitor screen C by using the 15 LINE SELECT on the waveform monitor.
14. Put the waveform monitor into the CHROMA mode.
15. S650 (MONITOR SELECT)/IF-538 panel→VBS
16. **Test Point** : MONITOR connector
    Adjustment Point : ⊘RV200 (R GAIN)/VA-163 panel
    ⊘RV400 (B GAIN)/VA-163 panel
    Specifications : Carrier leakage D = Minimum



(Waveform Monitor)

Resetting after Adjustment:

- S650/IF-538 panel → VBS
- G button/rear panel → OFF



VA-163 BOARD (A SIDE)

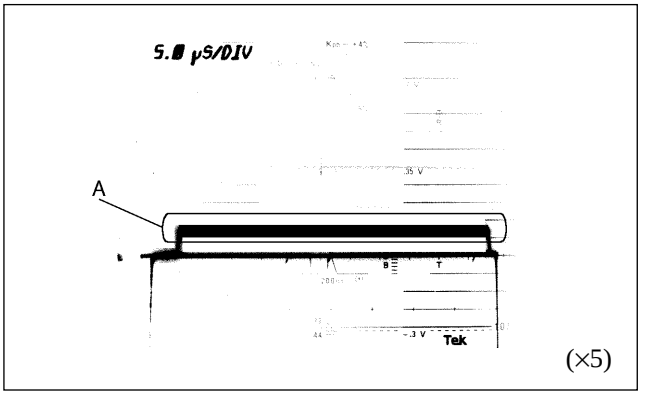
5-12. VA MOD Adjustment

Equipment : Waveform monitor
Test Point : MONITOR connector

Preparations:
- Connect the waveform monitor to the MONITOR connector.
- MASTER GAIN button/MSU operation panel → 0 dB
- S650 (MONITOR SELECT)/IF-538 panel → VF
- R button/rear panel → ON

Iris of the lens : CLOSE

Adjustment Procedures:
1. Set the waveform monitor as follows.
   • LUM mode
2. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
3. Set the menu as follows and adjust the VA MOD for R using the MENU SELECT knob/switch.
   MENU : Maintenance
   PAGE : White Shading (M2)
   ITEM : H Saw [R] → 99
   Adjustment Point:
   MENU : System config
   PAGE : PR/VA/TEST (S3)
   ITEM : VA MOD [R]
   Specifications: Flatten the portion A.
   Adjust so that the level at portion A does not fluctuate even if the setting value for H Saw [R] varies from 99 to –99.



(×5)

4. Adjust the VA MOD for G.
   R button/rear panel → OFF
   G button/rear panel → ON
   Set the menu as follows.
   MENU : Maintenance
   PAGE : White Shading (M2)
   ITEM : H Saw [G] → 99
   Adjustment Point:
   MENU : System config
   PAGE : PR/VA/TEST (S3)
   ITEM : VA MOD [G]
   Specifications: Flatten the portion A.
   Adjust so that the level at portion A does not fluctuate even if the setting value for H Saw [G] varies from 99 to –99.
5. Adjust the VA MOD for B.
   G button/rear panel → OFF
   B button/rear panel → ON
   Set the menu as follows.
   MENU : Maintenance
   PAGE : White Shading (M2)
   ITEM : H Saw [B] → 99
   Adjustment Point:
   MENU : System config
   PAGE : PR/VA/TEST (S3)
   ITEM : VA MOD [B]
   Specifications: Flatten the portion A.
   Adjust so that the level at portion A does not fluctuate even if the setting value for H Saw [B] varies from 99 to –99.

File Store:
Execute the file store. Throw the MENU SELECT switch to ENTER to execute.
MENU : Triming File
PAGE : Triming File (T1)
ITEM : File Store

Resetting after Adjustment:
- Set the menu as follows. Throw the MENU SELECT switch to ENTER to execute.
  MENU : Maintenance
  PAGE : White Shading (M2)
  ITEM : Clear
- S650 (MONITOR SELECT)/IF-538 panel → VBS
- R/G/B button/rear panel → OFF

5-13. Black Shading Adjustment

Notes:

- The compensation data obtained by the black shading adjustment is not stored in the OHB File. Therefore, when the OHB is replaced or a new OHB is installed, be sure to perform this adjustment.
- If the shading adjustment is not completed, perform the adjustment again following the message displayed on the viewfinder or MSU.
  If the re-adjustment still is not completed, consult Sony service representative.

Preparations:

- Connect the waveform monitor to the MONITOR connector.
- S650 (MONITOR SELECT)/IF-538 panel → VBS

Test Point : MONITOR connector
Iris of the lens : CLOSE

Adjustment Procedures:

1. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
2. Set the menu as follows and adjust the auto black shading. Throw the MENU SELECT switch to ENTER to execute.
   MENU : Maintenance
   PAGE : Auto Setup (M4)
   ITEM : Black Shading
3. Confirm the "OK" is displayed on the viewfinder or MSU. If the error message is displayed, perform the adjustment again following this message.
   Message and its meaning
   BLACK:OK : Adjustment correctly completed.
   LEVEL TOO HIGH : Lens closing does not operate fully, and so on.
   TIME LIMIT : Black shading adjustment could not be completed within the specified number of attempts.
   OVER FLOW : The difference between the reference value and the current value is too great, and exceeds adjustment range. Adjustment is then not completed.
4. Confirm the carrier level satisfies the specification on the waveform monitor.
   Specifications: Less than 2 IRE (for NTSC)
   Less than 14 mV (for PAL)

- **Manual Black Shading Adjustment (For reference)**

Note:

- Perform this adjustment only when "5-13. Black Shading Adjustment" is not completed.

Equipment : Waveform monitor

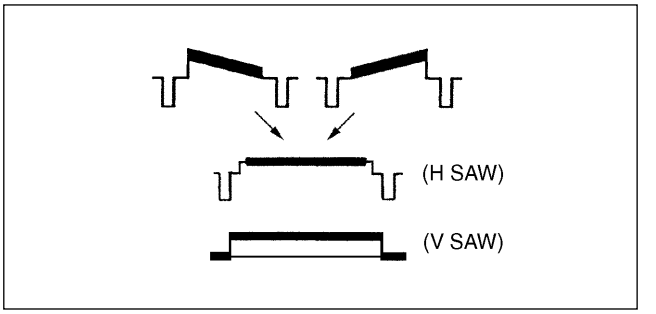
Preparations:

- Connect the waveform monitor to the MONITOR connector.
- S650 (MONITOR SELECT)/IF-538 panel → VF
- MASTER GAIN button/MSU operation panel → 18 dB

Test Point : MONITOR connector
Iris of the lens : CLOSE

Adjustment Procedures:

1. Set the waveform monitor as follows.
   • LUM mode
   • VOLTFULL SCALE range → 0.5
2. G button/rear panel → ON
3. Set the black level to 3 IRE for NTSC and 21 mV for PAL with the MASTER BLACK control/MSU operation panel.
4. If the shading is monitored, proceed as follows to make the waveform flat.
   MSU menu operation:
   • MAINTENANCE button → ON (Lights)
   • Touch panel operation
   [Adjusting] → [Black Shading] → [G]
   Adjustment Items: H SAW, V SAW



5. G button/rear panel → OFF
   R button/rear panel → ON
   Adjust the R-ch black shading in the same way.
6. R button/rear panel → OFF
   B button/rear panel → ON
   Adjust the B-ch black shading in the same way.

File Store:

1. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
2. Execute the file store. Throw the MENU SELECT switch to ENTER to execute.
   MENU : Reference File
   PAGE : Reference File (R1)
   ITEM : File Store

Resetting after Adjustment:

- MASTER GAIN button/MSU operation panel → 0 dB
- S650/IF-538 panel → VBS
- R/G/B button/rear panel → OFF

5-14. White Shading Adjustment

Notes:

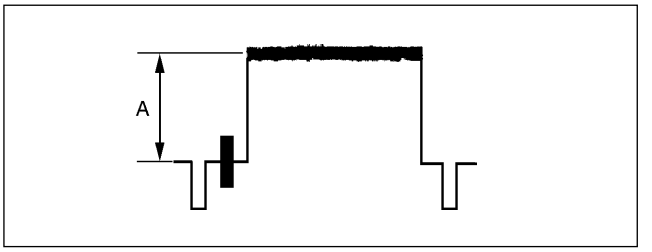
- This adjustment could not be correctly performed if the uneven white patten is used, luminance is not correct, or lens iris and lens zoom are not in good conditions.

Equipment : Waveform monitor
Test Point : MONITOR connector
Object : Full white pattern

Preparations:

- Connect the waveform monitor to the MONITOR connector.
- S650 (MONITOR SELECT)/IF-538 panel → VBS
- KNEE OFF button/MSU operation panel → OFF (Lights)
- Shoot the fully occupied white area of the pattern box in the full underscanned monitor frame adjusting the zoom control.

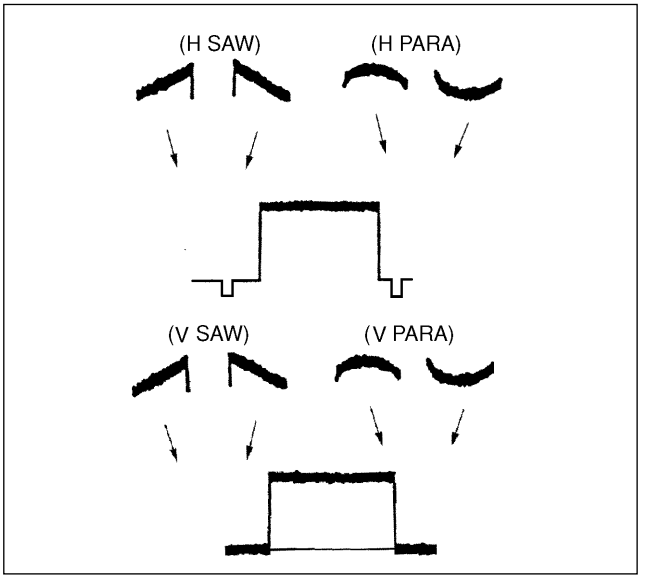
Iris of the lens : A = 80 ±5 IRE (for NTSC)
A = 560 ±14 mV (for PAL)



Adjustment Procedures:

1. Adjust the auto white balance.
   WHITE button/MSU operation panel → ON (Lights)
2. Set the waveform monitor as follows.
   • LUM mode
   • VOLTFULL SCALE range → 0.5
3. S650 (MONITOR SELECT)/IF-538 panel → VF
   G button/rear panel → ON

4. If the shading is monitored, proceed as follows to make the waveform flat.
   • MAINTENANCE button → ON (Lights)
   • Touch panel operation
   Adjusting → WhiteShading → G
   Adjustment Items : H SAW, H PARA, V SAW, V PARA



5. G button/rear panel → OFF
   R button/rear panel → ON
   Adjust the R-ch white shading in the same way.
6. R button/rear panel → OFF
   B button/rear panel → ON
   Adjust the B-ch white shading in the same way.

File Store:

1. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
2. Execute the file store. Throw the MENU SELECT switch to ENTER to execute.
   MENU : Reference File
   PAGE : Reference File (R1)
   ITEM : File Store

Resetting after Adjustment:

• S650/IF-538 panel → VBS
• R/G/B button/rear panel → OFF

5-15. Master Black Adjustment

Equipment : Waveform monitor
Test Point : MONITOR connector

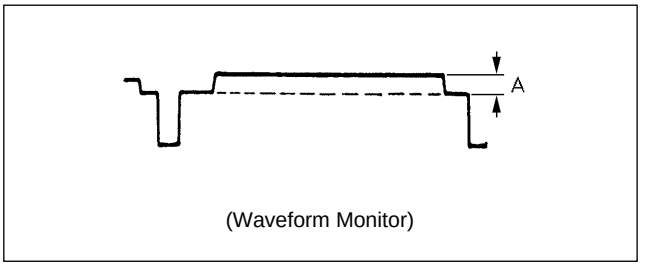
Preparations:

• Connect the waveform monitor to the MONITOR connector.
• S650 (MONITOR SELECT)/IF-538 panel → VF
• G button/rear panel → ON

Iris of the lens : CLOSE

Adjustment Procedures:

1. Set the waveform monitor as follows.
   • LUM mode
2. **Adjustment Point** : MASTER BLACK control/ MSU operation panel
   Specifications : A = 3 ±1 IRE (for NTSC)
   A = 21 ±7 mV (for PAL)



3. Adjust the auto black balance.
   BLACK button/MSU operation panel → ON (Lights)

File Store:

1. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
2. Execute the file store. Throw the MENU SELECT switch to ENTER to execute.
   MENU : Reference File
   PAGE : Reference File (R1)
   ITEM : File Store

Resetting after Adjustment:

• S650 (MONITOR SELECT)/IF-538 panel → VBS
• G button/rear panel → OFF

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5-16. Gamma Correction Adjustment

Equipment : Waveform monitor, Vectorscope
Test Point : MONITOR connector
Object : Grayscale chart

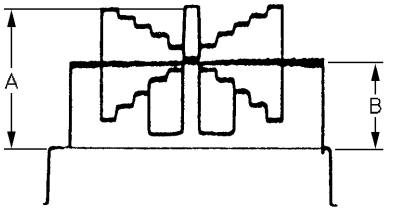
Preparations:

- Connect the waveform monitor to the MONITOR connector.
- Connect the waveform monitor to the PIX OUT terminal of the vectorscope.
- KNEE OFF button/MSU operation panel → OFF (Lights)
- GAMMA OFF button/MSU operation panel → ON (Stays out)
- S650 (MONITOR SELECT)/IF-538 panel → VBS
- Shoot the grayscale chart so that the chart frame is aligned with the underscanned monitor frame.

Iris of the lens : A = 100 ±2 IRE (for NTSC)
A = 700 ±14 mV (for PAL)

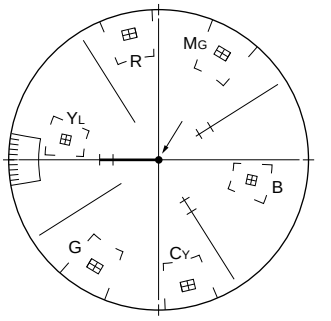
Adjustment Procedures:

1. S650 (MONITOR SELECT)/IF-538 panel → VF G button/rear panel → ON
2. Adjust the master gamma. Proceed as follows.
   MSU menu operation:
   • PAINT button → ON (Lights)
   • Touch panel operation
   Δ → (Page 2/3) → Gamma
   Adjustment Item : Master
   Specifications : B = 55.5 ±2.0 IRE (for NTSC)
   B = 420 ±14 mV (for PAL)

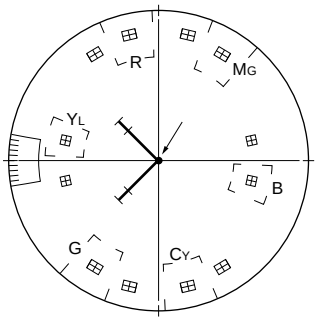


(Waveform Monitor)

3. Close the lens iris.
4. TEST 1 button/MSU operation panel → ON (Lights)
   S650(MONITOR SELECT)/IF-538 panel → VBS
5. Adjust the auto white balance.
   WHITE button/MSU operation panel → ON (Lights)
6. Adjust the R gamma. Proceed as follows.
   MSU menu operation:
   • PAINT button → ON (Lights)
   • Touch panel operation
   Δ → (Page 2/3) → Gamma
   Adjustment Item : R
   Specifications : Center the beam spot on the vectorscope.
7. Adjust the B gamma. Proceed as follows.
   MSU menu operation:
   • PAINT button → ON (Lights)
   • Touch panel operation
   Δ → (Page 2/3) → Gamma
   Adjustment Item : B
   Specifications : Center the beam spot on the vectorscope.
8. Repeat the steps 6 and 7 alternately, until the beam spot is minimized on the vectorscope.



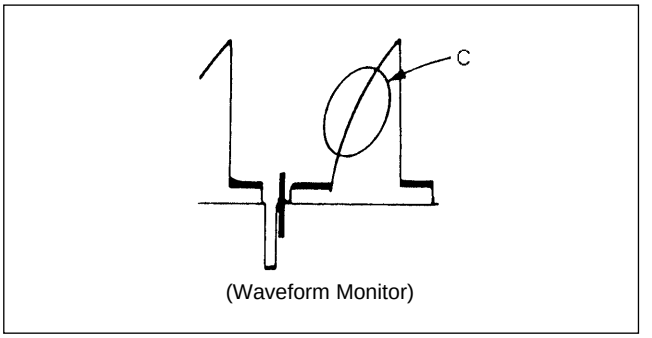
(For NTSC)



(For PAL)

(Vectorscope)

9. Confirm that the carrier leakage does not observed at portion C on the waveform monitor.
   Specifications : C = Minimum



(Waveform Monitor)

File Store:

1. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
2. Execute the file store. Throw the MENU SELECT switch to ENTER to execute.
   MENU : Reference File
   PAGE : Reference File (R1)
   ITEM : File Store

Resetting after Adjustment:

- TEST 1 button/MSU operation panel → OFF (Goes out)
- G button/rear panel → OFF

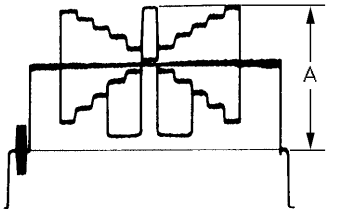
5-17. Flare Adjustment

Equipment : Waveform monitor
Test Point : MONITOR connector
Object : Grayscale chart

Preparations:

- Connect the waveform monitor to the MONITOR connector.
- KNEE OFF button/MSU operation panel → OFF (Lights)
- S650 (MONITOR SELECT)/IF-538 panel → VBS
- Shoot the grayscale chart so that the chart frame is aligned with the underscanned monitor frame.

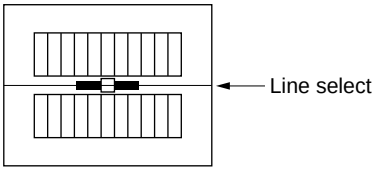
Iris of the lens : A = 100 ±2 IRE (for NTSC)
A = 700 ±14 mV (for PAL)



(Waveform Monitor)

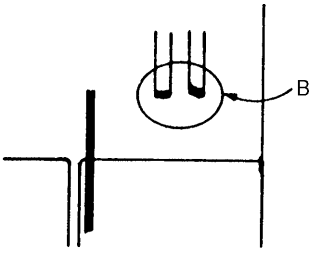
Adjustment Procedures:

1. Adjust the auto white balance.
   WHITE button/MSU operation panel → ON (Lights)
2. Open the iris control of the lens by two stops against the reference setup (corresponding to the above A).
3. S650 (MONITOR SELECT)/IF-538 panel → VF
   G button/rear panel → ON
4. Select the 15 lines in the center of the monitor screen by using the 15 LINE SELECT on the waveform monitor.



(Waveform Monitor)

5. **MSU menu operation**:
   • PAINT button → ON (Lights)
   • Touch panel operation
   (Page 1/3) → Flare → Flare Off (Reversed)
   Confirm that the level at portion B does not fluctuate even if the flare is turned on/off.
6. If fluctuates, adjust the G flare as follows.
   • Touch panel operation
   Turn the flare on. (Flare Off is not reversed.)
   Adjustment Items: G
7. S650 (MONITOR SELECT)/IF-538 panel → VBS
8. Adjust the R flare.
   Adjustment Item : R
   Specifications : Minimize the carrier leakage.
9. Adjust the B flare.
   Adjustment Item : B
   Specifications : Minimize the carrier leakage.



(Waveform Monitor)

10. Repeat the steps 8 and 9 alternately, until the carrier leakage is minimized.

File Store:

1. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
2. Execute the file store. Throw the MENU SELECT switch to ENTER to execute.
   MENU : Reference File
   PAGE : Reference File (R1)
   ITEM : File Store

Resetting after Adjustment:

• G button/rear panel → OFF

5-18. Pre Knee Adjustment

Equipment : Oscilloscope, Waveform monitor

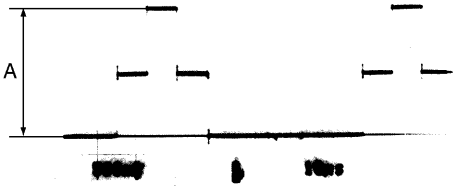
Preparations:

• Extend the VA-163 board with the EX-464 extension board.
• S650 (MONITOR SELECT)/IF-538 panel → VBS
• KNEE OFF button/MSU operation panel → ON (Goes out)
• MASTER GAIN button/MSU operation panel → 9 dB
• TEST 2 button/MSU operation panel → ON (Lights)

Iris of the lens : CLOSE

Adjustment Procedures:

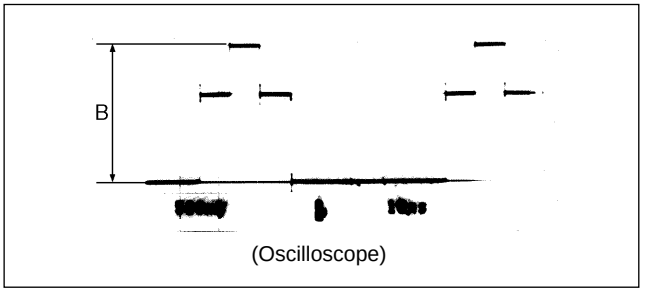
1. Adjust the auto white balance.
   WHITE button/MSU operation panel → ON (Lights)
2. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
3. Adjust the Preknee1 for G. Proceed as follows.
   Test Point : TP52 (GND:GND(A))/extension board (extending VA-163)
   Adjustment Point:
   MENU : System config
   PAGE : Pre Knee/Zebra (S4)
   ITEM : PreKnee1[G]
   Specifications : A = 1.68 ±0.02 V p-p



(Oscilloscope)

4. MASTER GAIN button/MSU operation panel → 12 dB

5. Adjust the Preknee2 for G. Proceed as follows.
   Test Point : TP52 (GND:GND(A))/extension board (extending VA-163)
   Adjustment Point:
   MENU : System config
   PAGE : Pre Knee/Zebra (S4)
   ITEM : PreKnee2[G]
   Specifications : B = 1.80 ±0.02 V p-p



(Oscilloscope)

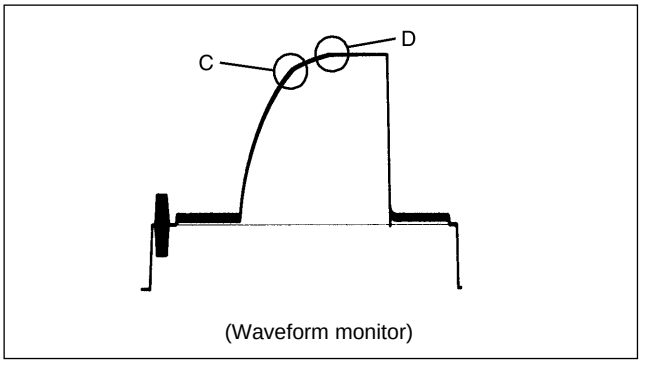
6. TEST 1 button/MSU operation panel → ON (Lights).
   AUTO KNEE button/MSU operation panel → ON (Lights).
   MASTER GAIN button/MSU operation panel → 18dB

7. Adjust the Preknee1 for R. Proceed as follows.
   Test Point : MONITOR connector
   Adjustment Point:
   MENU : System config
   PAGE : Pre Knee/Zebra (S4)
   ITEM : PreKnee1[R]
   Specifications : Minimize the carrier leakage C.

8. Adjust the Preknee1 for B. Proceed as follows.
   Test Point : MONITOR connector
   Adjustment Point:
   MENU : System config
   PAGE : Pre Knee/Zebra (S4)
   ITEM : PreKnee1[B]
   Specifications : Minimize the carrier leakage C.

9. Adjust the Preknee2 for R. Proceed as follows.
   Test Point : MONITOR connector
   Adjustment Point:
   MENU : System config
   PAGE : Pre Knee/Zebra (S4)
   ITEM : PreKnee2[R]
   Specifications : Minimize the carrier leakage D.

10. Adjust the Preknee2 for B. Proceed as follows.
    Test Point : MONITOR connector
    Adjustment Point:
    MENU : System config
    PAGE : Pre Knee/Zebra (S4)
    ITEM : PreKnee2[B]
    Specifications : Minimize the carrier leakage D.



(Waveform monitor)

File Store:

Execute the file store. Throw the MENU SELECT switch to ENTER to execute.
MENU : Triming File
PAGE : Triming File (T1)
ITEM : File Store

Resetting after Adjustment:

- MASTER GAIN button/MSU operation panel → 0 dB
- TEST 1 button/MSU operation panel → OFF (Goes out)

5-19. Knee and White Clip Adjustment

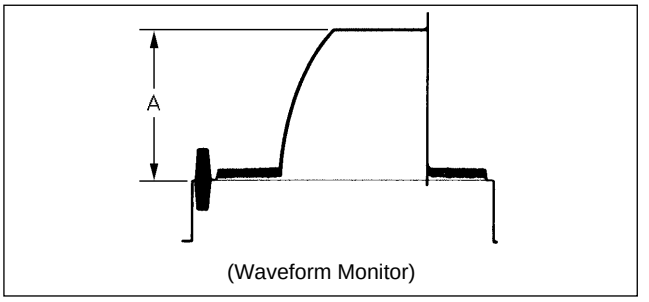
Equipment : Waveform monitor
Test Point : MONITOR connector

Preparations:

- Connect the waveform monitor to the MONITOR connector.
- S650 (MONITOR SELECT)/IF-538 panel → VBS
- KNEE OFF button/MSU operation panel → ON (Goes out)
- MASTER GAIN button/MSU operation panel → 9 dB

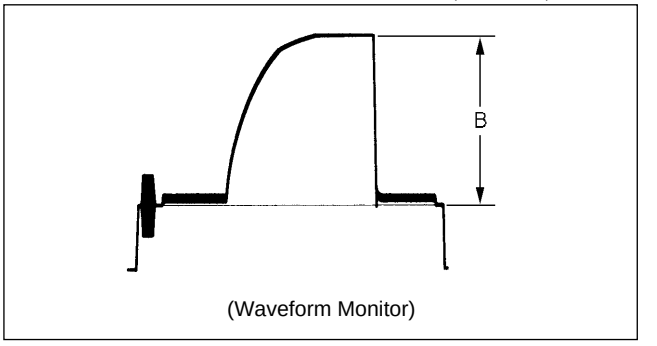
Adjustment Procedures:

1. Confirm that the black level is 3 IRE for NTSC and 21 mV for PAL.
2. Adjust the auto black balance.
   BLACK button/MSU operation panel → ON (Lights)
3. TEST 1 button/MSU operation panel → ON (Lights)
4. Adjust the knee point. Proceed as follows.
   MSU menu operation:
   • PAINT button → ON (Lights)
   • Touch panel operation
   [Δ] → (Page 2/3) → [White Clip]
   → [White Clip Off] (Reversed)
   (Page 2/3) → [Knee Point] → [Knee Max]
   Adjustment Item : Master
   Specifications : A = 98 ±2 IRE (for NTSC)
   A = 686 ±10 mV (for PAL)



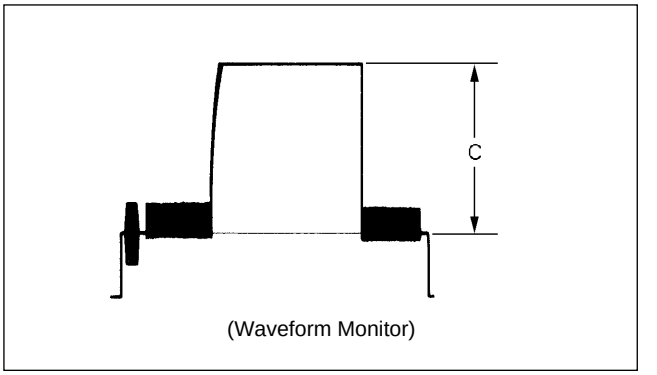
(Waveform Monitor)

5. Adjust the knee slope. Proceed as follows.
   MSU menu operation:
   • PAINT button → ON (Lights)
   • Touch panel operation
   (Page 2/3) → [Knee Point]
   Turn off the knee max. ([Knee Max] is not reversed.)
   (Page 2/3) → [Knee Slope]
   Adjustment Item: Master
   Specifications : B = 109 ±2 IRE (for NTSC)
   B = 763 ±10 mV (for PAL)



(Waveform Monitor)

6. MASTER GAIN button/MSU operation panel → 18 dB
7. Adjust the white clip. Proceed as follows.
   MSU menu operation:
   • PAINT button → ON (Lights)
   • Touch panel operation
   (Page 2/3) → [White clip]
   Turn on the white clip. ([White Clip Off] is not reveresed.)
   Adjustment Item : Master
   Specifications : C = 109 ±2 IRE (for NTSC)
   C = 750 ±10 mV (for PAL)



(Waveform Monitor)

Resetting after Adjustment:

- TEST 1 button/MSU operation panel → OFF (Goes out)
- MASTER GAIN button/MSU operation panel → 0 dB

File Store:

1. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
2. Execute the file store. Throw the MENU SELECT switch to ENTER to execute.
   MENU : Reference File
   PAGE : Reference File (R1)
   ITEM : File Store

Note:

The values used in the above adjustments are under the conditions that the white clip level is set to 109 IRE (for NTSC) or 763 mV (for PAL).
When the white clip level is set to other value than 109 IRE or 763 mV, use the following table to set the levels of the knee point and knee slope.

	White Clip Level (Unit: IRE/mV)			
	109/763	107/749	105/735	103/721
Knee point	98/686	98/686	96/672	96/672
Knee slope	109/763	109/763	107/750	107/750
White clip	109/763	107/749	105/735	103/721

- As for the detail adjustments, refer to Section 4, 4-10 to 4-18. Adjust according to the customer's preferences.

5-20. A/D CLOCK PHASE Adjustment

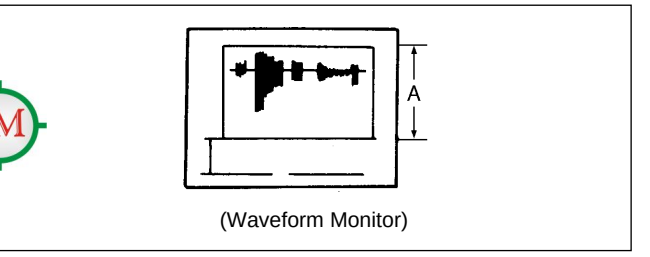
Equipment : Waveform monitor
Test Point : MONITOR connector
Object : Multiburst chart

Preparations:

- Connect the waveform monitor to the MONITOR connector.
- Shoot the multiburst chart so that the chart frame is aligned with the underscaned monitor frame with the zoom control.
  Pan so that the 9 MHz portion of the multiburst chart is positioned at the center of the monitor screen.
- AUTO KNEE button/MSU operation panel → ON (Lights)
- S650 (MONITOR SELECT)/IF-538 panel → VBS

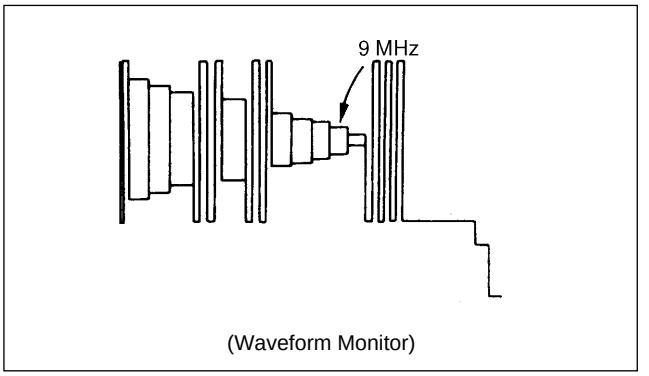
Adjustment Procedures:

1. **Iris of the lens**: A = 90 ±2 IRE (for NTSC)
   A = 630 ±10 mV (for PAL)



(Waveform Monitor)

2. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
3. Set the menu as follows and adjust the G clock phase using the MENU SELECT knob/switch.
   Adjustment Point:
   MENU : System config
   PAGE : PR/VA/TEST (S3)
   ITEM : G Clock
   Specifications : Maximize the 9 MHz signal portion.
4. Adjust the R and B clock phases.
   Adjustment Point:
   MENU : System config
   PAGE : PR/VA/TEST (S3)
   ITEM : R/B Clock
   Specifications : Minimize the aliasing around 9MHz signal portion.



(Waveform Monitor)

File Store:

Execute the file store. Throw the MENU SELECT switch to ENTER to execute.

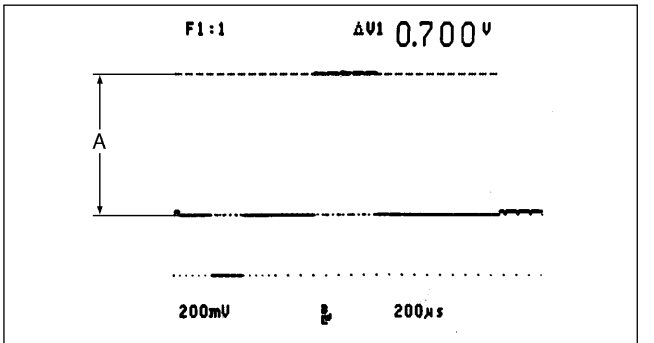
MENU : Triming File
PAGE : Triming File (T1)
ITEM : File Store

5-21. CCU Y/R-Y/B-Y Adjustment

Equipment : Oscilloscope

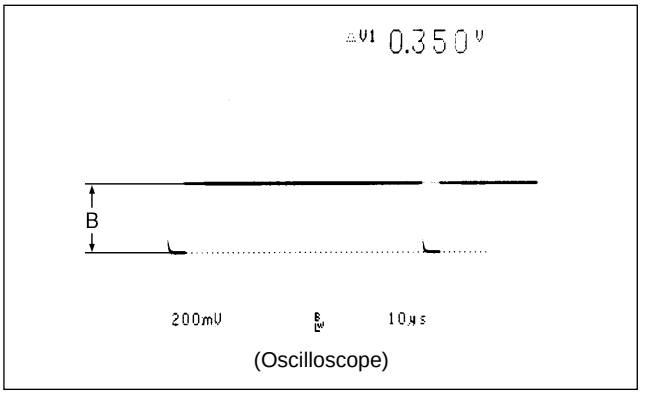
Adjustment Procedures:

1. Set the DISPLAY switch/rear panel to MENU while pushing up the MENU SELECT switch to ENTER.
2. Set the menu as follows and adjust the CCU Y sample using the MENU SELECT knob/switch.
   Test Point : TP3 (Y)(GND:E1)/DA-88 panel
   Adjustment Point:
   MENU : System config
   PAGE : VTR/CCU (S5)
   ITEM : CCU Y SAMP
   Specifications : A = 700 ±2 mV



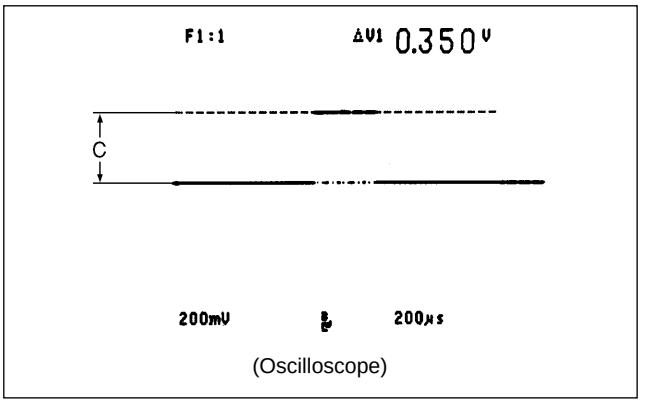
(Oscilloscope)

3. Set the menu as follows and adjust the CCU R-Y sync using the MENU SELECT knob/switch.
   Test Point : TP4 (R-Y)(GND:E1)/DA-88 panel
   Adjustment Point:
   MENU : System config
   PAGE : VTR/CCU (S5)
   ITEM : CCU R-Y SYNC
   Specifications : B = 350 ±2 mV



(Oscilloscope)

4. Set the menu as follows and adjust the CCU B-Y sample using the MENU SELECT knob/ switch.
   Test Point : TP5 (B-Y)(GND:E1)/DA-88 panel
   Adjustment Point:
   MENU : System config
   PAGE : VTR/CCU (S5)
   ITEM : CCU B-Y SAMP
   Specifications : C = 350 ±2 mV

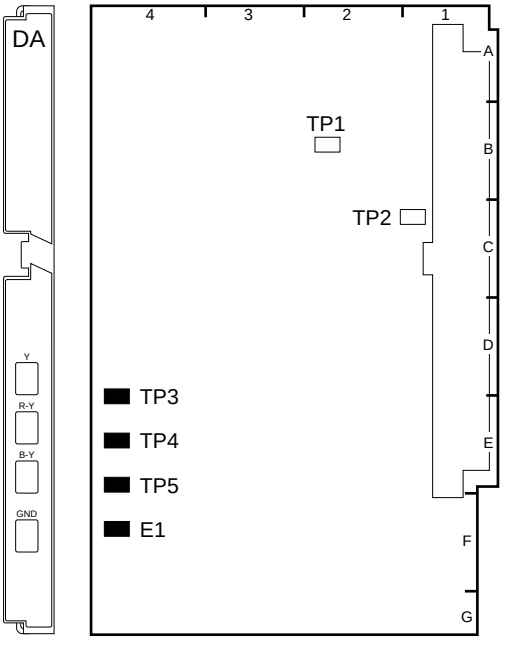


(Oscilloscope)

File Store:
Execute the file store. Throw the MENU SELECT switch to ENTER to execute.
MENU : Triming File
PAGE : Triming File (T1)
ITEM : File Store

5-22. Settings After Finishing Adjustment

- DETAIL OFF button/MSU operation panel → ON (Goes out)
- GAMMA OFF button/MSU operation panel → ON (Goes out)
- KNEE OFF button/MSU operation panel → ON (Goes out)
- Execute the reference file store.
  MENU : Reference File
  PAGE : Reference File (R1)
  ITEM : File Store
  (Throw the MENU SELECT switch to ENTER to execute.)



DA-88 BOARD (A SIDE)

5-23. Audio Modulation/Demodulation Adjustment

Note :
⊘RV1 and ⊘RV3 on the AU-211 board and ⊘RV40, ⊘RV200, ⊘RV300 and ⊘RV301 on the AU-215 board can be set according to a customer's preference.
For details, refer to Section 1-5 "Function of Internal Switches/Controls".

5-23-1. BATTERY ALARM SET Adjustment

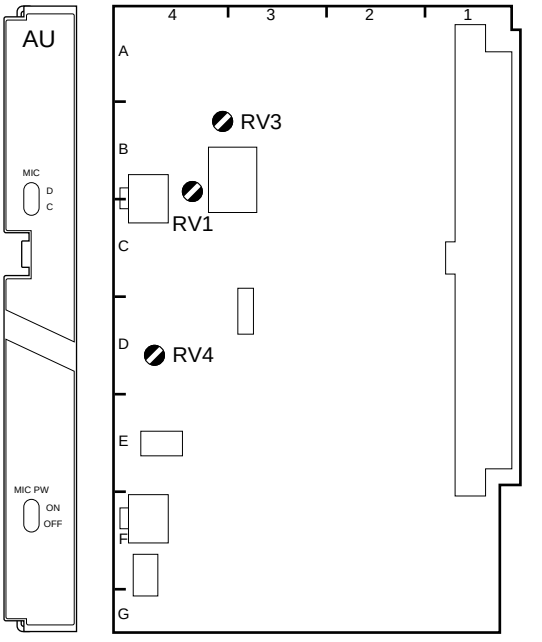
Notes :
- This adjustment is only for the camera incorporating the standalone unit BKP-5910/5910P.
- Adjustment for ⊘RV4 is very critical. Do not turn it as far as the circuit normally activates.

Equipment : Digital voltmeter Oscilloscope
DC variable power supply

Preparation :
- Supply about +13 Vdc from the DC variable power supply via the DC IN connector of the BKP-5910/5910P.

Adjustment Point : ⊘RV4/AU-211 (D-4)

Adjustment Procedures :
1. Turn ⊘RV4 fully clockwise.
2. Measure voltage at TP84 (GND:GND A)/extension board (extending AU-211).
3. Adjust the voltage at TP84 for +11.20 ±0.05 V.
4. Slowly turn ⊘RV4 counterclockwise observing the waveform at TP42/extension board (extending AU-211) on the oscilloscope.
5. Adjust ⊘RV4 so that an 1.0-Hz, 8.0-Vp-p rectangler wave just appears.



AU-211 BOARD (A SIDE)

5-23-2. MIC 1 RF Adjustment

Notes :

- This adjustment requires longer warm-up periods (10 to 30 minutes).
- Use a plastic core driver to adjust ⊘LV.

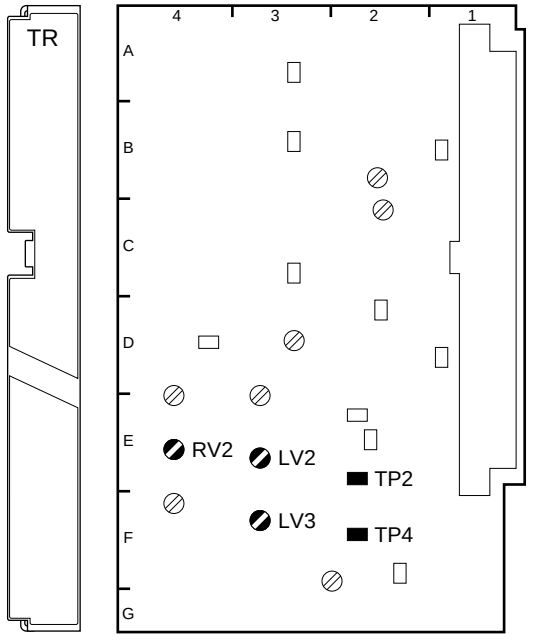
Equipment : Frequency counter
Test Point : TP2/TR-90 (E-2)
Adjustment Point : ⊘LV2 (6.2 MHz)/TR-90 (E-3)
Specifications : 6,200 ±5 kHz

5-23-3. MIC 2 RF Adjustment

Notes :

- This adjustment requires longer warm-up periods (10 to 30 minutes).
- Use a plastic core driver to adjust ⊘LV.

Equipment : Frequency counter
Test Point : TP4/TR-90 (F-2)
Adjustment Point : ⊘LV3 (6.7 MHz)/TR-90 (F-3)
Specifications : 6,700 ±5 kHz



TR-90 BOARD (A SIDE)

5-23-4. MIC 1 DEVIATION Adjustment

Note :

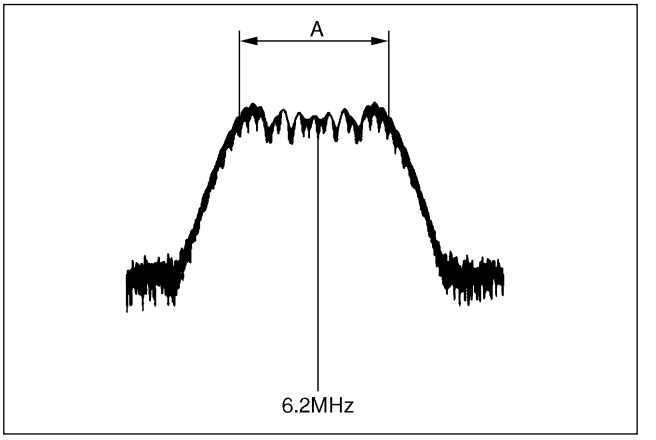
- This adjustment requires longer warm-up periods (10 to 30 minutes).

Equipment : Spectrum analyzer
Audio generator

Preparations :

- SW6 (MIC LINE SEL)/AU-211 (E-4) → MIC 1
- CCU-700/700P/700A/700AP setting
  S1003 (MIC LEVEL CH1)/AT-88 panel→ NORM
- Feed an 1.0-kHz, –60 dBu (2.2 mVp-p) sine wave signal from the audio generator to the MIC CH-1 connector. (Refer to Section 5-1-4 “Connection—For audio adjustments”.

Test Point : TP2/TR-90 (E-2)
Adjustment Point : ⊘RV2 (MIC1 DEV)/TR-90 (E-4)
Specifications : A = 16.0 ±0.8 kHz



CENTER FREQ	6.2 MHz
SPAN	50 kHz
RBW	1 kHz

Resetting after Adjustment:

- S1003/AT-88 → customer-set position

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5-23-5. MIC 2 DEVIATION Adjustment

Note :

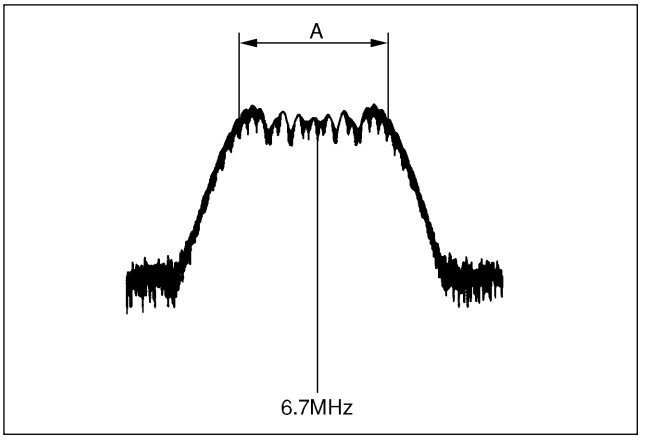
- This adjustment requires longer warm-up periods (10 to 30 minutes).

Equipment : Spectrum analyzer
Audio generator

Preparations :

- CCU-700/700P/700A/700AP setting
  S1004 (MIC LEVEL CH2)/AT-88 panel→ NORM
- Feed an 1.0-kHz, -60 dBu (2.2 mVp-p) sine wave signal from the audio generator to the MIC CH-2 connector. (Refer to Section 5-1-4 “Connection —For audio adjustments”.

Test Point : TP4/TR-90 (F-2)
Adjustment Point : ⊘RV3 (MIC2 DEV)/TR-90 (F-4)
Specifications : A = 18.0 ±0.8 kHz



CENTER FREQ	6.7 MHz
SPAN	50 kHz
RBW	1 kHz

Resetting after Adjustment:

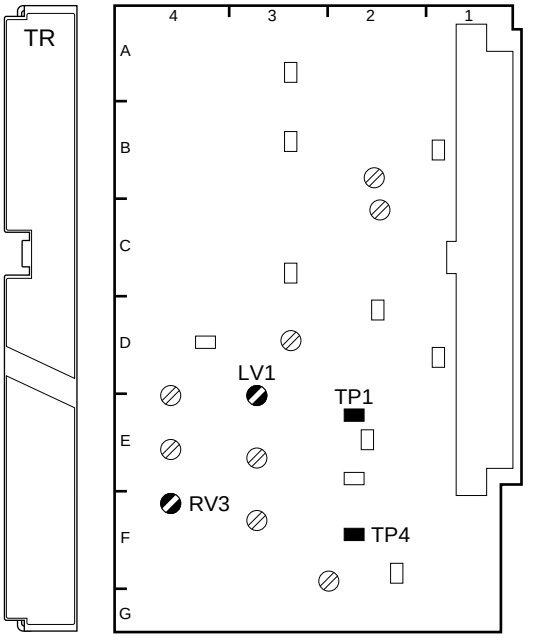
- S1004/AT-88 → customer-set position

5-23-6. INCOM RF Adjustment

Notes :

- This adjustment requires longer warm-up periods (10 to 30 minutes).
- Use a plastic core driver to adjust ⊘LV.

Equipment : Frequency counter
Test Point : TP1/TR-90 (E-2)
Adjustment Point : ⊘LV1 (7.1 MHz)/TR-90 (E-3)
Specifications : 7,100 ±5 kHz



TR-90 BOARD (A SIDE)

5-23-7. INCOM DEVIATION Adjustment

Note :

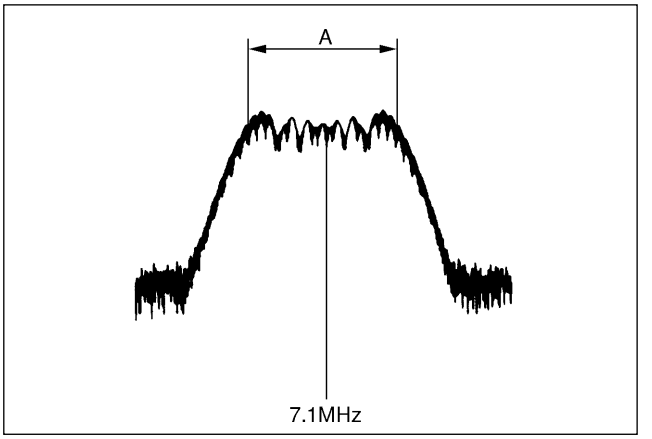
- This adjustment requires longer warm-up periods (10 to 30 minutes).

Equipment : Spectrum analyzer
Audio generator

Preparations :

- SW1 (INCOM MIC SEL)/AU-211 panel→ D
- Feed an 1.0-kHz, -60 dBu (2.2 mVp-p) sine wave signal from the audio generator to the INTERCOM connector. (Refer to Section 5-1-4 “Connection —For audio adjustments”.

Test Point : TP1/TR-90 (E-2)
Adjustment Point : ⊘RV1 (INCOM DEV)/TR-90 (E-4)
Specifications : A = 20.0 ±0.8 kHz



CENTER FREQ	7.1 MHz
SPAN	50 kHz
RBW	1 kHz

Resetting after Adjustment:

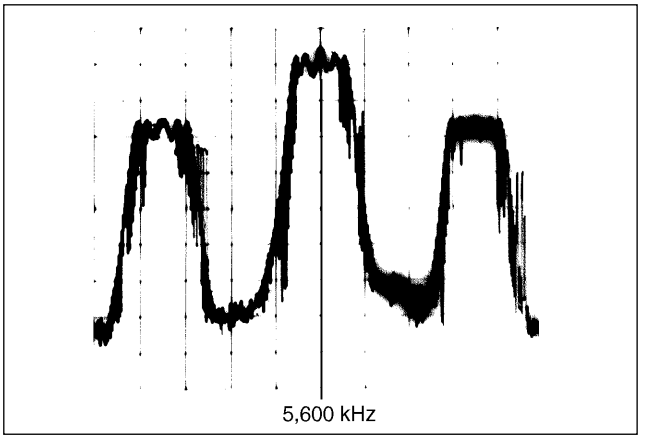
- SW1/AU-211 panel → C

5-23-8. DATA RF Adjustment

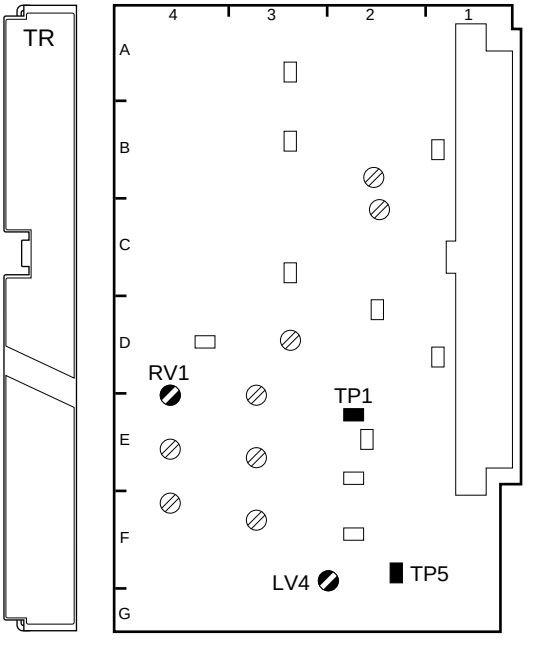
Notes :

- This adjustment requires longer warm-up periods (10 to 30 minutes).
- Use a plastic core driver to adjust ⊘LV.

Equipment : Spectrum analyzer
Test Point : TP5/TR-90 (F-2)
Adjustment Point : ⊘LV4 (5.6 MHz)/TR-90 (F-2)
Specifications : Center frequency 5,600 ±5 kHz



CENTER FREQ	5,600 kHz
SPAN	100 kHz
RBW	1 kHz



TR-90 BOARD (A SIDE)

5-23-9. INCOM Demodulation Adjustment

Notes :

- This adjustment is necessary only when replacing T202 or T203 on the TR-90 board.
- Use a plastic core driver to adjust ⊘T.

Equipment : Oscilloscope Audio generator
Audio analyzer

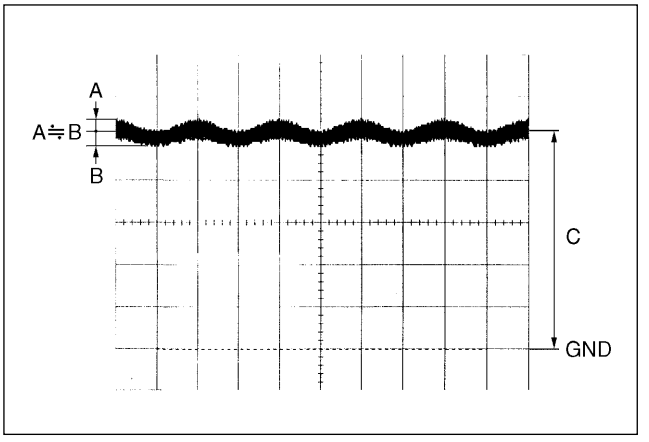
Preparations :

- INTERCOM level control/rear panel→ ↷fully clockwise
- CCU-700/700P/700A/700AP setting
  Extend the AT-88 board of the CCU.
  S2081 (PGM IN 0 dB/-20 dB)/AT-88 (D-5)→ 0dB
  S2082 (PGM MIX ON/OFF)/AT-88 (F-5)→ ON

Test Point : Pin 4 (X), Pin 3 (G)/
INTERCOM connector

Adjustment Procedures:

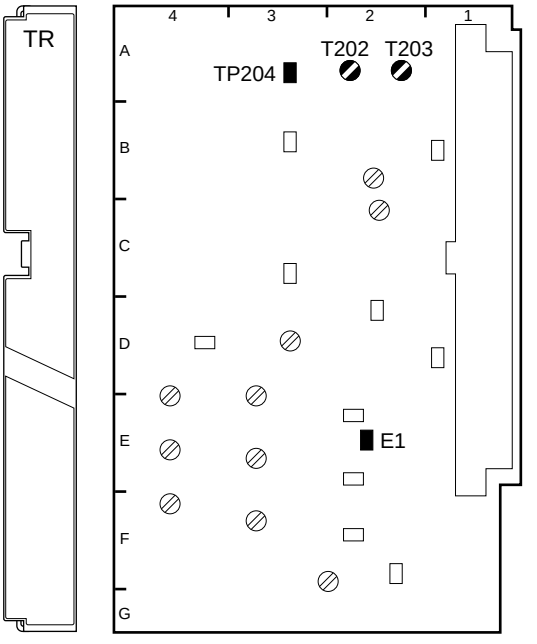
1. Feed an 1.0-kHz sine wave signal from the audio generator to pins D68 (X), A69 (Y), and B69 (GND) on the extension board (extending AT-88) referring to Section 5-1-4 “Connection — For audio adjustments”.
2. Adjust the audio generator so that the level at TP44 (GND:E1)/AT-88 (L-7) is 200 mVp-p.
3. Connect the oscilloscope to TP204 (GND:E1)/TR-90 (A-3).
4. Slowly turn ⊘T202 (A-2) until a sign wave appears around 5.0 Vdc. Adjust ⊘T202 for the following specifications.
   Adjustment Point : ⊘T202/TR-90 (A-2)
   Specifications : C = 5.0 ±0.1 Vdc



5. **Adjustment Point** : ⊘T203/TR-90 (A-2)
   Specifications : The distortion is 0.3% or less and minimum.

Resetting after Adjustment:

- S2081, S2082/AT-88 → customer-set position



TR-90 BOARD (A SIDE)

5-23-10. PGM Demodulation Adjustment

Note :

- This adjustment is necessary only when replacing T200 or T201 on the TR-90 board.
- Use a plastic core driver to adjust ⊘T.

Equipment : Oscilloscope Audio generator
Audio analyzer

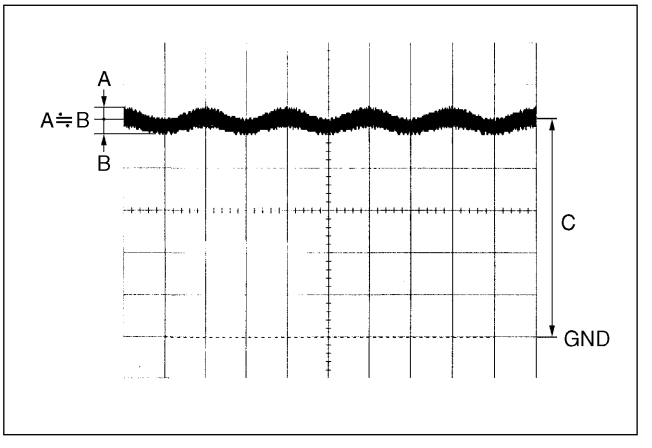
Preparations :

- PGM level control/rear panel→ ↺fully clockwise
- CCU-700/700P/700A/700AP setting
  Extend the AT-88 board of the CCU.
  S2081 (PGM IN 0 dB/-20 dB)/AT-88 (D-5)→ 0dB
  S2082 (PGM MIX ON/OFF)/AT-88 (F-5)→ OFF

Test Point : Pin 5 (X), Pin 3 (G)/
INTERCOM connector

Adjustment Procedures:

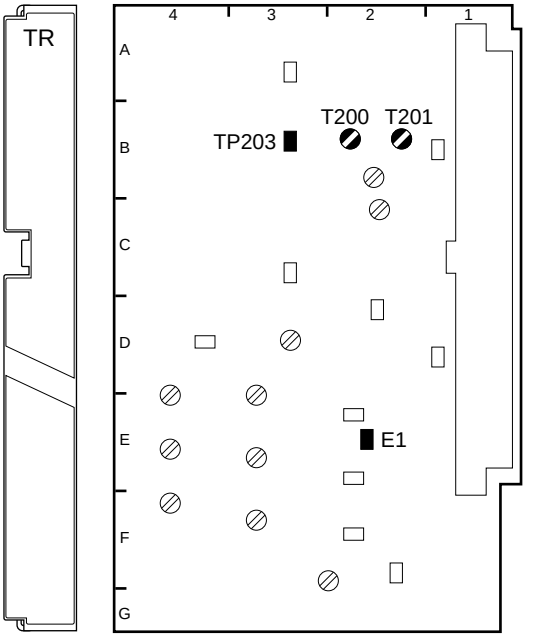
1. Feed an 1.0-kHz sine wave signal from the audio generator to pins D68 (X), A69 (Y), and B69 (GND) on the extension board (extending AT-88) referring to Section 5-1-4 “Connection — For audio adjustments”.
2. Adjust the audio generator so that the level at TP44 (GND:E1)/AT-88 (L-7) is 200 mVp-p.
3. Connect the oscilloscope to TP203 (GND:E1)/TR-90 (B-3).
4. Slowly turn ⊘T200 (B-2) until a sign wave appears around 5.0 Vdc. Adjust ⊘T200 (B-2) for the following specifications.
   Adjustment Point : ⊘T200/TR-90 (A-2)
   Specifications : C = 5.0 ±0.1 Vdc



5. **Adjustment Point** : ⊘T201/TR-90 (B-2)
   Specifications : The distortion is 0.3% or less and minimum.

Resetting after Adjustment:

- S2081, S2082/AT-88 → customer-set position



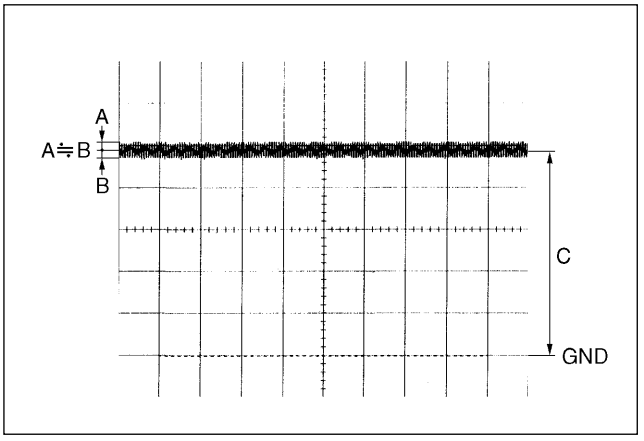
TR-90 BOARD (A SIDE)

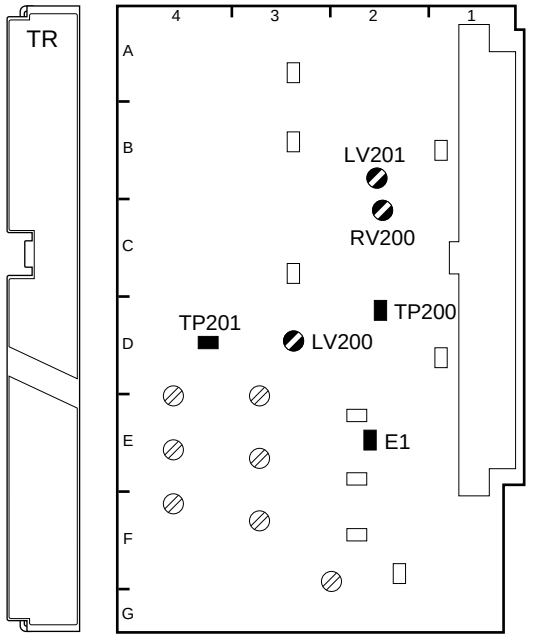
5-23-11. DATA Demodulation Circuit Adjustment

Note :

- Use a plastic core driver to adjust ⊘LV.

Equipment : Oscilloscope
Test Point : TP201 (GND:E1)/TR-90 (D-4)
Adjustment Point : ⊘LV200/TR-90 (D-3)
Specifications : C = 4.9 ±0.1 V





TR-90 BOARD (A SIDE)

5-23-12. H CONT Demodulation Circuit Adjustment

Note :

- Use a plastic core driver to adjust ⊘LV.

Equipment : Digital voltmeter or Oscilloscope
DC variable power supply
Frequency counter

Preparations :

- Turn on the POWER switch of the camera power assembly.
- CCU-700/700P/700A/700AP setting
  Extend the AT-88 board of the CCU.
  Supply +2.5 Vdc to pin C19 (GND:E1)/extension board (extending AT-88) from the DC variable power supply.
  Observing the frequency counter, adjust the DC variable power supply so that the frequency at TP1 (GND:E2)/AT-88 (G-7) is 2.500 ±0.005 MHz.

Test Point : TP81/extension board
(extending TR-90)

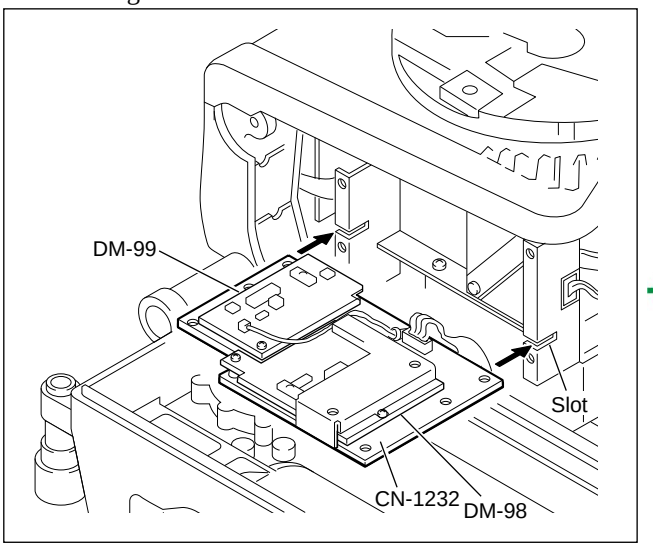
Adjustment Procedures:

1. Turn off the POWER switch.
2. Connect between TP59 and TP90/extension board (extending TR-90).
3. **Adjustment Point** : ⊘LV201/TR-90 (B-2)
   Specifications : 2.5 ±0.2 Vdc
4. Disconnect TP90 and connect between TP59 and GND A.
5. **Adjustment Point** : ⊘RV200/TR-90 (C-2)
   Specifications : 2.5 ±0.2 Vdc

5-24. Video Modulation/Demodulation Adjustment

Notes :

- Refer to Sections 5-1-4 and 5-1-5 for connection and initial settings.
- Make sure that the adjustments of Sections 5-2 through 5-22 are complete.
- ◓RV2 on the DM-98 board does not function in the unit.
- When adjusting the DM-98/99 board, remove the CN-1232 board as follows.
  (1) Open the left side panel.
  (2) Remove the four screws securing the CN-1232 board to the unit.
  (3) Insert the CN-1232 board into the slots as shown in the figure



5-24-1. VCO 45 MHz Adjustment

Note :

- This adjustment requires longer warm-up periods (10 to 30 minutes).

Equipment : Frequency counter
Test Point : TP9 (GND:E1)/MD-103 (F-2)
Adjustment Point : ◓RV13 (VCO ADJ)/MD-103 (F-3)
Specifications : 45, 000,000 ±10 Hz

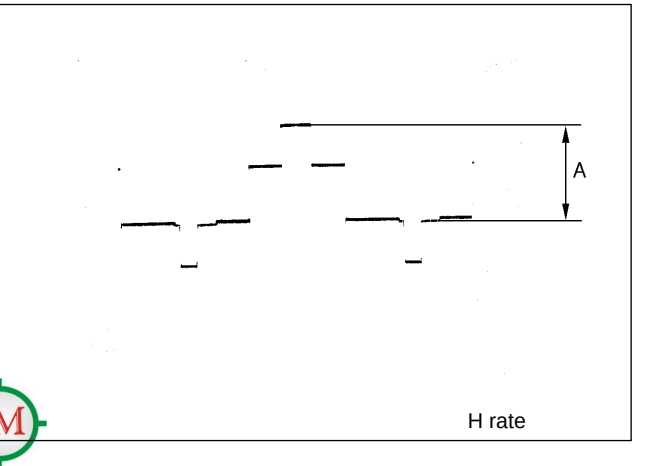
5-24-2. Y Level Adjustment

Equipment : Oscilloscope

Preparation :

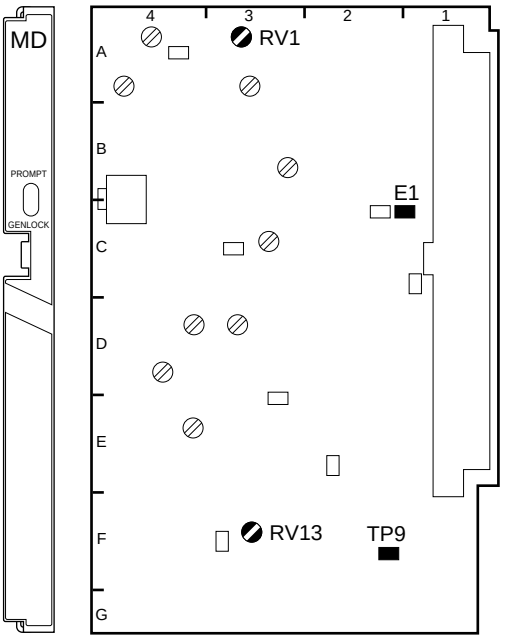
- TEST 2 button MSU operation panel→ ON (Lights)

Test Point : TP61 (GND:TP59)/extension board (extending MD-103)
Adjustment Point : ◓RV1 (VTR Y LVL)/ MD-103 (A-3)
Specifications : A = 1400 mV ±2%



Resetting after Adjustment:

- TEST 2 button/MSU operation panel → OFF (Goes out)



MD-103 BOARD (A SIDE)

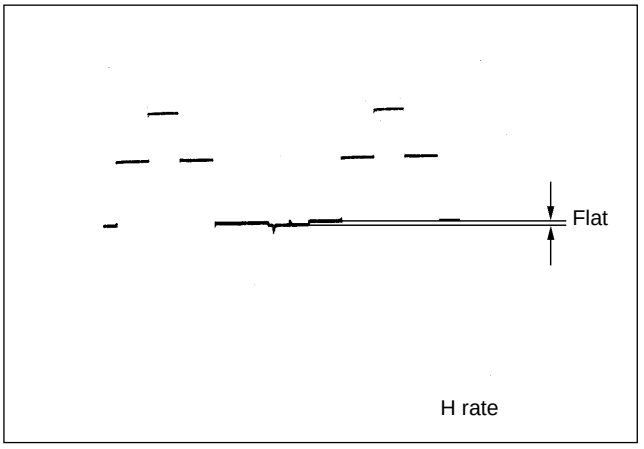
5-24-3. Y SYNC Cancel Adjustment

Equipment : Oscilloscope

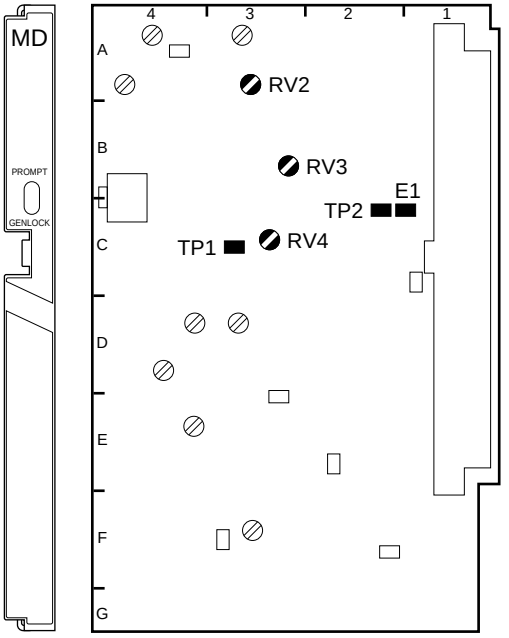
Preparation :
- TEST 2 button MSU operation panel→ ON (Lights)

Test Point : TP1 (GND:E1)/MD-103 (C-3)
Adjustment Point : ◓RV2 (SYNC CANCEL)/ MD-103 (A-3)

Adjustment Procedures:
Adjust ◓RV2 so that the H SYNC portion is flat.



Resetting after Adjustment:
- TEST 2 button MSU operation panel → OFF (Goes out)

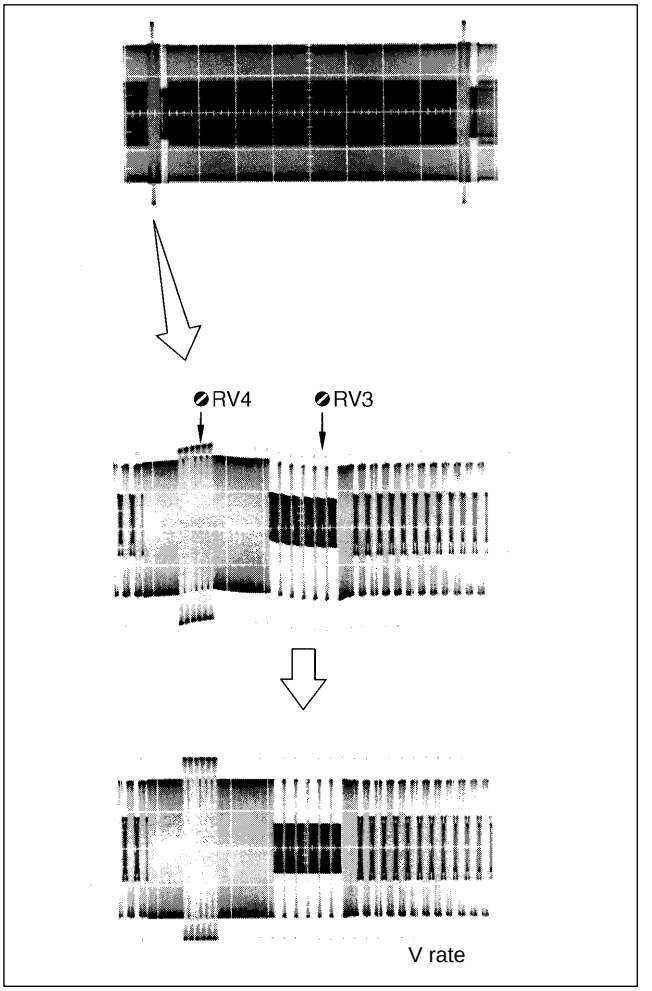


MD-103 BOARD (A SIDE)

5-24-4. Y/SKIN DC Balance Adjustment

Equipment : Oscilloscope (LIMITER→ OFF)
Test Point : TP2 (GND:E1)/MD-103 (C-2)
Trigger : SYNC OUTPUT connector/ CCU rear panel
Adjustment Points : ◓RV3 (Y DC BAL)/MD-103 (B-3)
◓RV4 (SKIN DC BAL)/MD-103 (C-3)

Adjustment Procedure :
Adjust ◓RV3 and ◓RV4 alternately until the V SYNC portions are flat.



5-24-5. Y/SKIN 90° Adjustment

Notes :

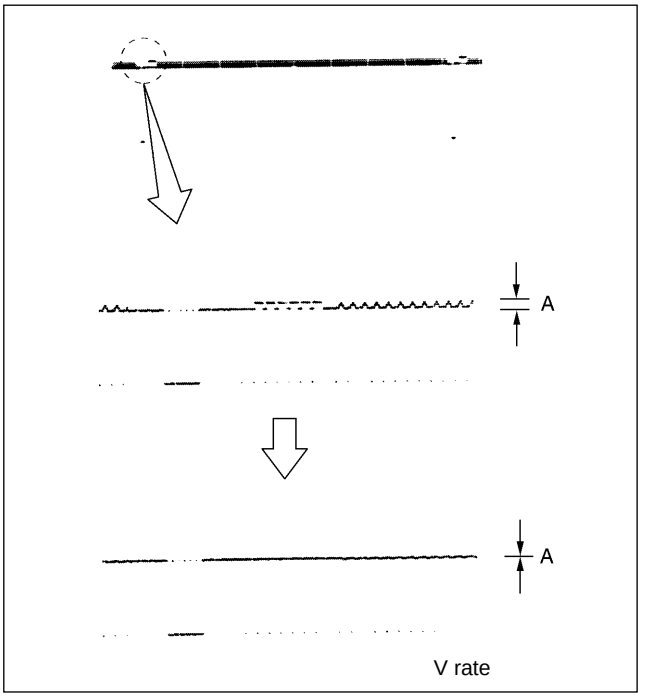
- This adjustment is necessary only when replacing FL2 on the MD-103 board.
- Use a plastic core driver to adjust ⊘FL.

Equipment : Oscilloscope

Preparation:

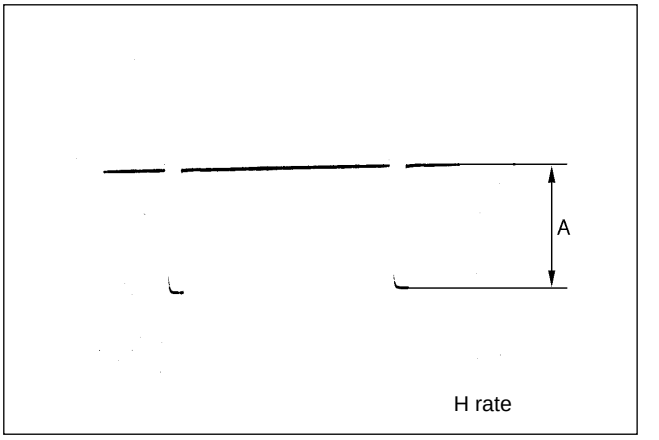
- CCU-700/700P/700A/700AP setting
  Extend the DM-94 board of the CCU.

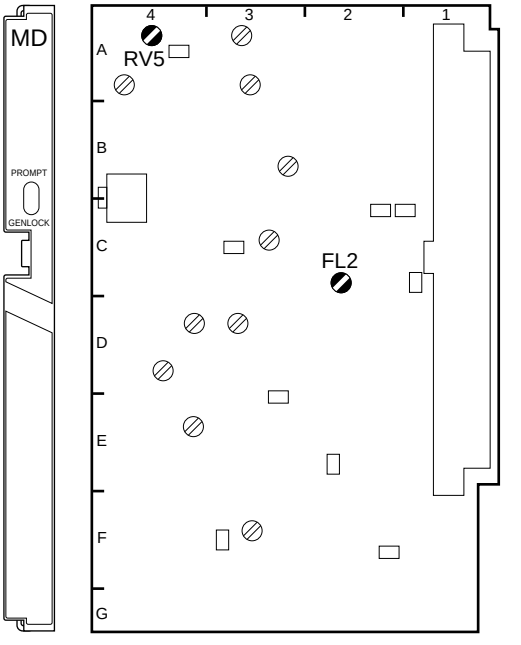
Test Point : TP26 (GND:E5)/DM-94 (F-8)
Trigger : SYNC OUTPUT connector/ CCU rear panel
Adjustment Point : ⊘FL2/MD-103 (C-2)
Specifications : A = 0 ±2 mV



5-24-6. R-Y Level Adjustment

Equipment : Oscilloscope
Test Point : TP63 (GND:TP65)/extension board (extending MD-103)
Adjustment Point : ⊘RV5 (VTR R-Y LVL)/ MD-103 (A-4)
Specifications : A = 700 ±14 mV

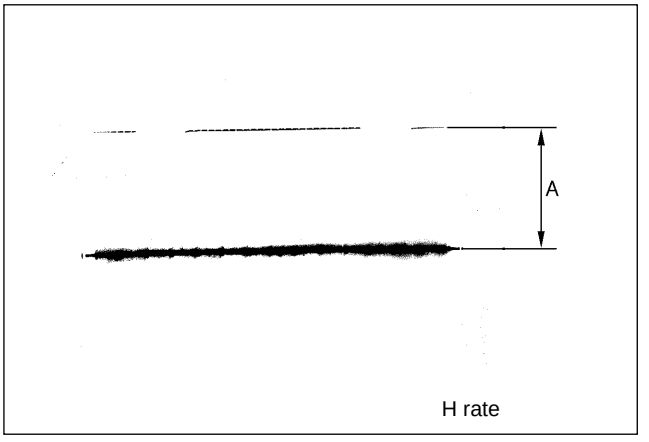




MD-103 BOARD (A SIDE)

5-24-7. B-Y Level Adjustment

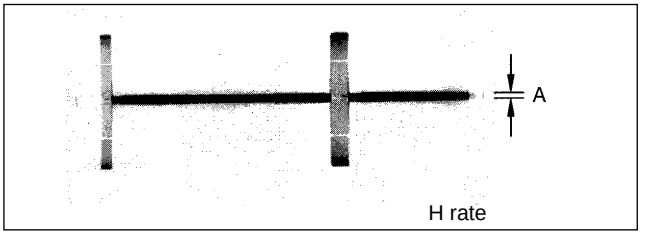
Equipment : Oscilloscope
Test Point : TP67 (GND:TP69)/extension board (extending MD-103)
Adjustment Point : ⊘RV9 (VTR B-Y LVL)/ MD-103 (A-4)
Specifications : A = 700 ±14 mV

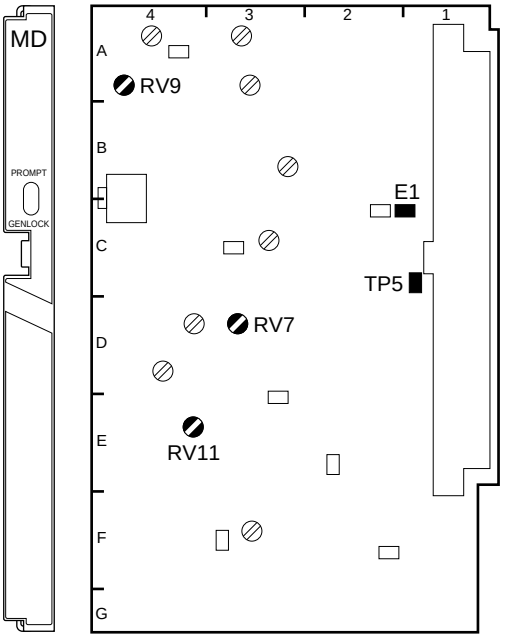


5-24-8. R-Y/B-Y Carrier Balance Adjustment

Equipment : Oscilloscope (LIMITER→ OFF)
Test Point : TP5 (GND:E1)/MD-103 (C-1)
Adjustment Points : ⊘RV7 (R-Y CAR BAL)/MD-103 (D-3)
⊘RV11 (B-Y CAR BAL)/MD-103 (E-4)

Adjustment Procedure :
Adjust ⊘RV7 and ⊘RV11 alternately so that the amplitude "A" is minimum.



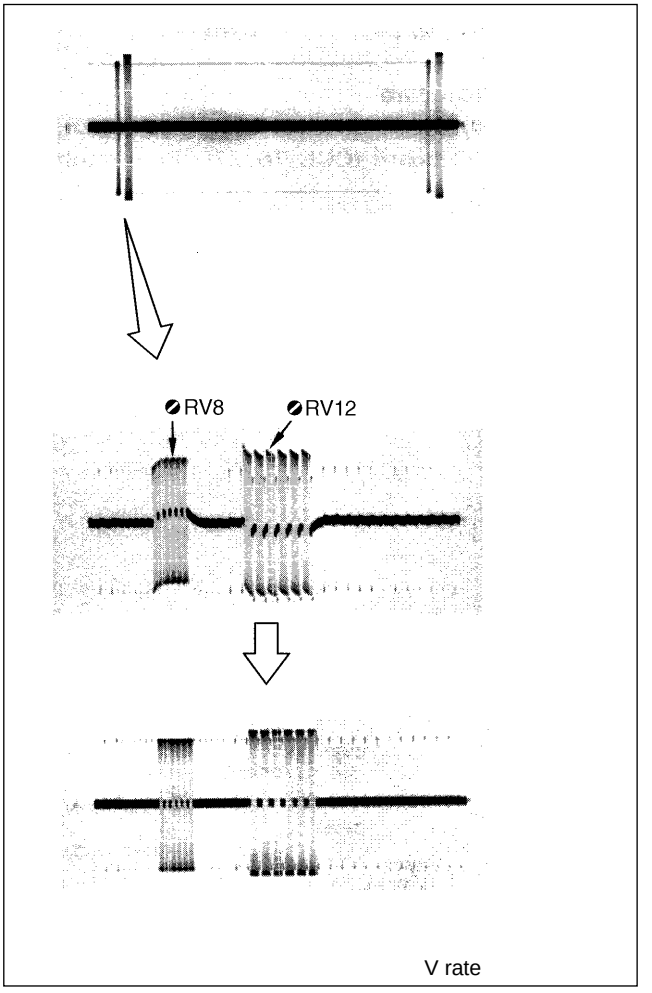


MD-103 BOARD (A SIDE)

5-24-9. R-Y/B-Y DC Balance Adjustment

Equipment : Oscilloscope (LIMITER→ OFF)
Test Point : TP5 (GND:E1)/MD-103 (C-1)
Adjustment Points : ⊘RV8 (R-Y DC BAL)/MD-103 (D-4)
⊘RV12 (B-Y DC BAL)/MD-103 (D-4)

Adjustment Procedure :
Adjust ⊘RV8 and ⊘RV12 alternately so that the V BLKG portions are flat.



5-24-10. R-Y/B-Y 90° Adjustment

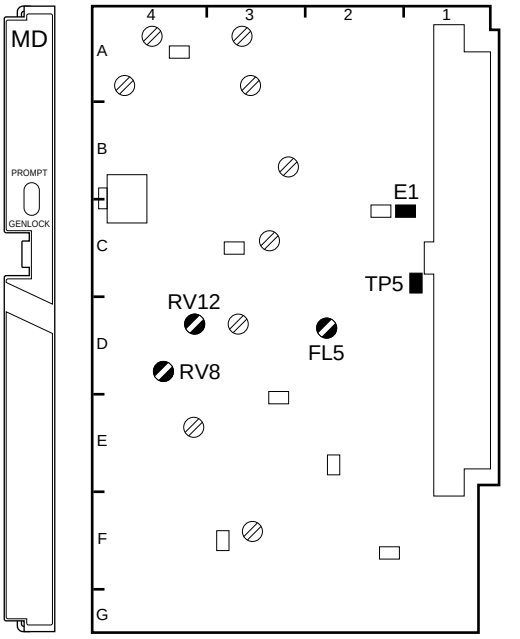
Notes :
- This adjustment is necessary only when replacing FL5 on the MD-103 board.
- Use a plastic core driver to adjust ⊘FL.

Equipment : Digital voltmeter or Oscilloscope (DC mode)

Preparation:
- CCU-700/700P/700A/700AP setting
  Extend the DM-94 board of the CCU.

Test Point : TP14 (GND:E12)/DM-94 (K-5)
Adjustment Point : ⊘FL5/MD-103 (D-2)

Adjustment Procedure :
Adjust ⊘FL5 so that a negative absolute value of DC voltage is maximum.
The voltage changes slowly. When reading the value, allow for 2 or 3 seconds after turning ⊘FL5.



MD-103 BOARD (A SIDE)

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5-24-11. 67.5 MHz TRAP Adjustment

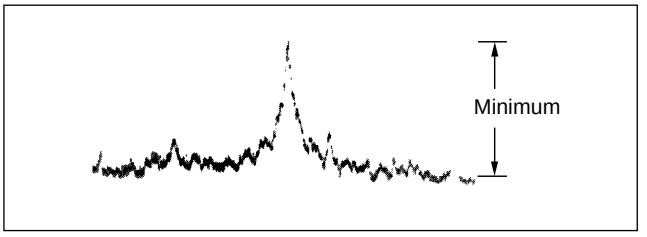
Notes :

- This adjustment requires longer warm-up periods (10 to 30 minutes).
- This adjustment is necessary only when replacing FL3 on the MD-103 board.
- Use a plastic core driver to adjust ⊘FL.

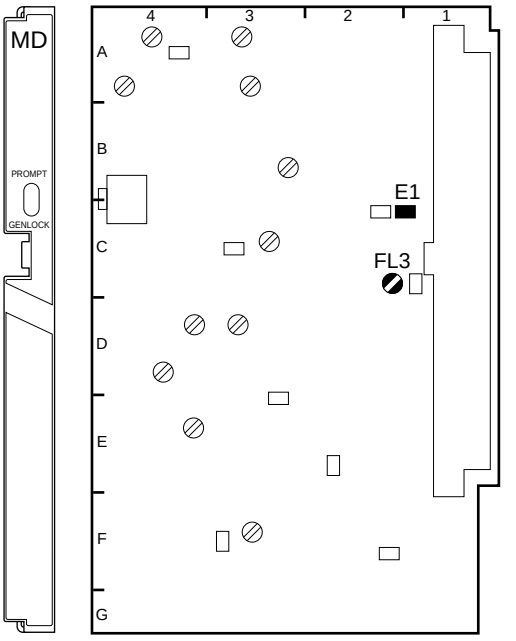
Equipment : Spectrum analyzer
Test Point : Pin 53 (GND:E1/MD-103)/ extension board (extending MD-103)
Adjustment Point : ⊘FL3 (67.5 MHz TRAP)/ MD-103 (C-2)

Adjustment Procedure :

Adjust ⊘FL3 so that the signal level around 67.5 MHz is minimum.



CENT FREQ	67.5 MHz
SPAN	2.0 MHz



MD-103 BOARD (A SIDE)

5-24-12. RETURN VIDEO Demodulation Adjustment

Notes :

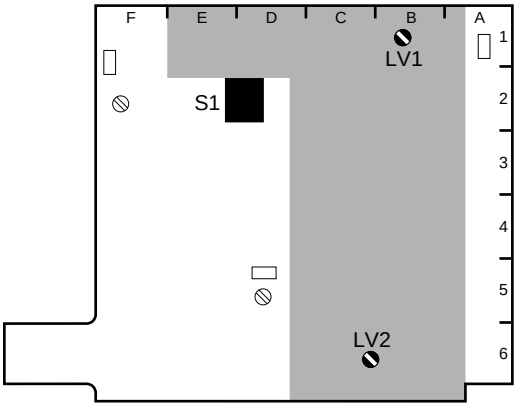
- Remove the CN-1232 board in advance referring to section 5-24 “Notes”.
- This adjustment is necessary only when replacing the DM-98 board, or replacing LV1 or LV2 on the board.
- Use a plastic core driver to adjust ⊘LV.
- Use a TRIAX cable whose length is 300 to1000 m for this adjustment.

Equipment : Waveform Monitor, Vectorscope
Video Signal Generator
(provides a 10-step signal with CHROMA signal)

Preparations :

- Set S1-1 to S1-4 /DM-98 (D-2) to all OFF.
- S650 (MONITOR SELECT) /IF-538 panel→RET
- Feed the10-step signal from the video signal generator to the RET 1 IN connector on the CCU rear panel.

Test Point : MONITOR connector/
BVP-500/500P

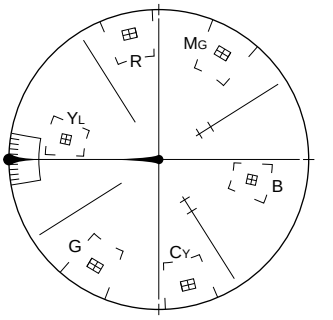


DM-98 BOARD (A SIDE)

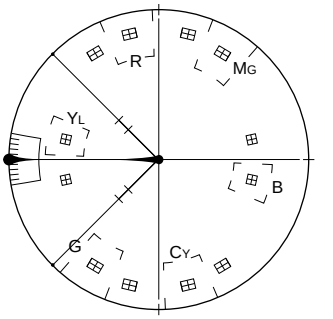
Adjustment Points : ⊘LV1 (RET FREQ)/DM-98 (B-1)
⊘LV2 (RET TUNE)/DM-98 (C-6)

Adjustment Procedures:

1. Temporarily adjust ⊘LV2 (C-6) so that the waveform appears observing the waveform monitor.
2. Adjust ⊘LV1 (B-1) so that the values of DG and DP are minimum observing the vectorscope.
3. Slightly turn ⊘LV2 so that they are further minimum.
4. Adjust ⊘LV1 and ⊘LV2 alternately until the specifications are satisfied.
   Specifications : DG = ±3%, DP = ±3°



(For NTSC)



(For PAL)

Resetting after Adjustment:

- S1-4/DM-98 → ON
- S650/IF-538 panel → VBS

5-24-13. RETURN VIDEO Level Adjustment

Notes :

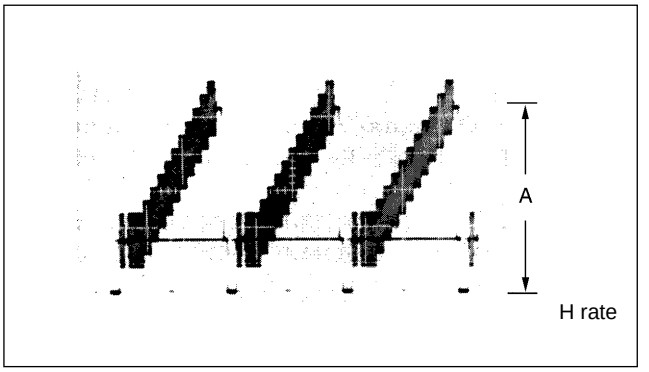
- Remove the CN-1232 board in advance referring to section 5-24 “Notes”.
- This adjustment is necessary only when replacing the DM-98 board.
- Use a TRIAX cable whose length is 1000 m or less for this adjustment.

Equipment : Waveform monitor
Video signal generator
(provides a 10-step signal)

Preparations :

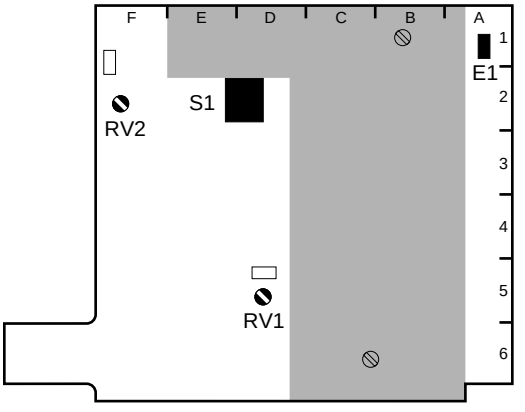
- Set S1-1 to S1-4/DM-98 (D-2) to all OFF.
- S650 (MONITOR SELECT)/IF-538 panel → RET
- Feed the10-step signal from the video signal generator to the RET 1 IN connector on the CCU rear panel.

Test Point : MONITOR connector/
BVP-500/500P
Adjustment Point : ⊘RV1 (RET LEVEL)/DM-98 (D-5)
Specifications : A = 1.00 ±0.05 Vp-p



Note :

- S1-4/DM-98 → ON
- S650/IF-538 panel → VBS



DM-98 BOARD (A SIDE)

5-24-14. PROMPT VIDEO Demodulation Adjustment

Notes :

- Remove the CN-1232 board in advance referring to section 5-24 “Notes”.
- This adjustment is necessary only when replacing LV1 on the DM-99 board.
- Use a TRIAX cable whose length is 500 m or more for this adjustment.
- Use a plastic core driver to adjust ⊘LV.

Equipment : Oscilloscope, Video signal generator (provides SWEEP and 10-step signals)

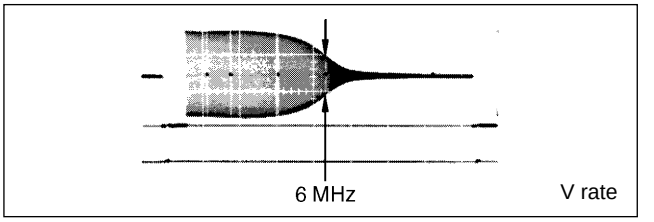
Preparations :

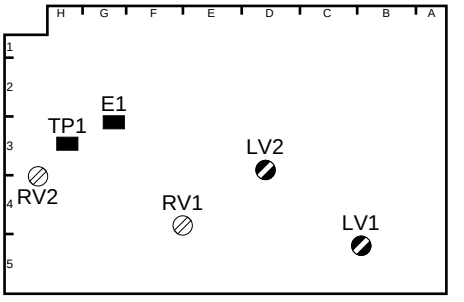
- CCU-700/700P/700A/700AP setting
  S1 (MODE AUTO/MANU)/DM-94 (P-1) →AUTO
  S5 (PROMPT POWER SELECT)/DM-94 (G-8) →TX
  S6 (PROMPT RF SELECT)/DM-94 (M-8) →TX
- Feed the SWEEP signal from the video signal generator to the PROMPTER connector on the CCU rear panel.

Test Point : PROMPT connector/BVP-500/500P
Adjustment Points : ⊘LV1 (PROMPT FREQ) /
DM-99 (C-5)
⊘LV2 (PROMPT TUNE) /
DM-99 (D-3)

Adjustment Procedures:

1. Temporarily adjust⊘LV2 (D-3) so that the waveform appears observing the oscilloscope.
2. Adjust ⊘LV1 (C-5) so that the gain level around 6 MHz is minimum.



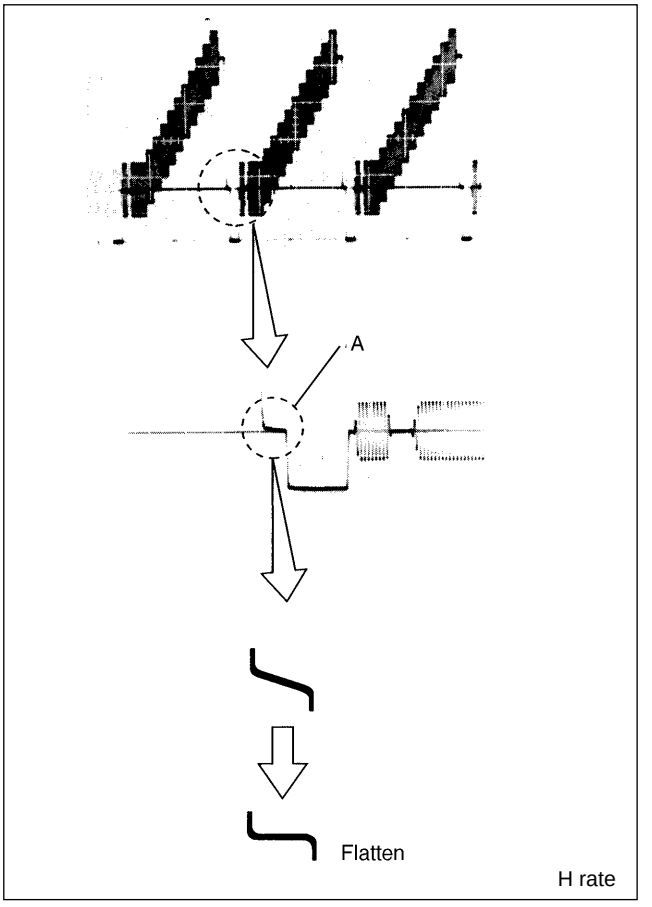


DM-99 BOARD (A SIDE)

3. Change the output signal from the video signal generator to the 10-step signal.
4. Adjust ⊘LV2 so that the portion A is flat.

Note

If the specifications are not satisfied, after performing Section 5-24-15. "PROMPT VIDEO RF AGC Adjustment", perform this adjustment again.



Resetting after Adjustment:

- S1, S5, S6/DM-94 →customer-set position

5-24-15. PROMPT VIDEO RF AGC Adjustment

Notes :

- Remove the CN-1232 board in advance referring to section 5-24 "Notes".
- Use a TRIAX cable whose length is 50 m or 150 m for this adjustment.

Equipment : Oscilloscope, Video signal generator (provides a 10-step signal)

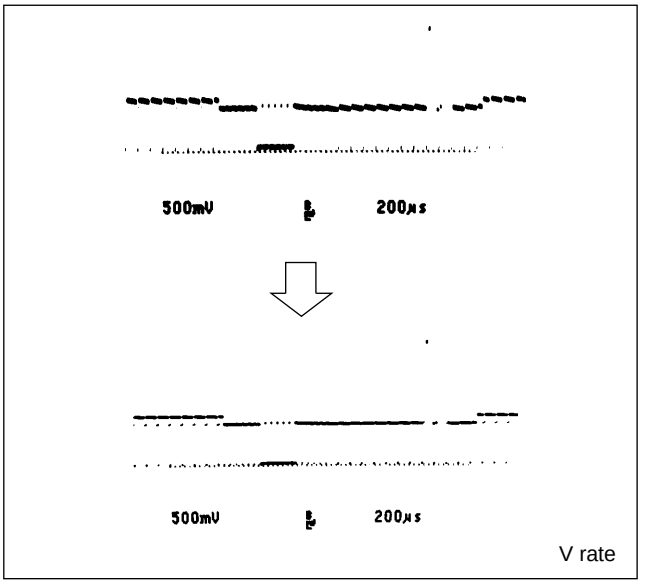
Preparations :

- CCU-700/700P/700A/700AP setting
  S1 (MODE AUTO/MANU)/DM-94 (P-1) →MANU
  S2 (CABLE LENGTH)/DM-94 (P-1)→ 1
  S5 (PROMPT POWER SELECT)/DM-94 (G-8) →TX
  S6 (PROMPT RF SELECT)/DM-94 (M-8) →TX
- Feed the 10-step signal from the video signal generator to the PROMPTER connector on the CCU rear panel.

Test Point : TP1/DM-99 (H-3)
Adjustment Point : ⊘RV1 (RF AGC DLY) /DM-99 (E-5)

Adjustment Procedures:

1. Turn ⊘RV1 fully clockwise.
2. Slowly turn ⊘RV1(E-5) counterclockwise and stop it at the point where the SYNC level becomes maximum and does not sag, observing the waveform at TP1. Do not turn ⊘RV1 too much.



Resetting after Adjustment:

- S1, S2, S5, S6/DM-94 →customer-set position

5-24-16. PROMPT VIDEO Level Adjustment

Notes :

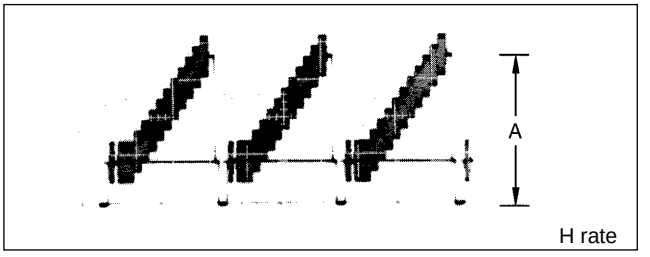
- Remove the CN-1232 board in advance referring to section 5-24 “Notes”.
- This adjustment is necessary only when replacing the DM-99 board.
- Use a TRIAX cable whose length is 500 m or more for this adjustment.

Equipment : Waveform monitor, Video signal generator (provides a 10-step signal)

Preparations:

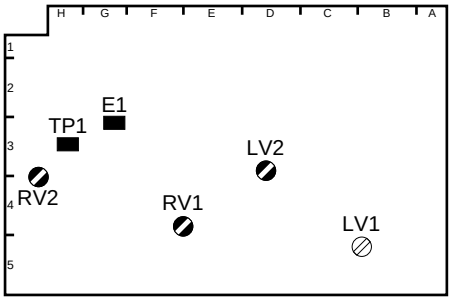
- CCU-700/700P/700A/700AP setting
  S1 (MODE AUTO/MANU)/DM-94 (P-1) →AUTO
  S5 (PROMPT POWER SELECT)/DM-94 (G-8) →TX
  S6 (PROMPT RF SELECT)/DM-94 (M-8) →TX
- Feed the 10-step signal from the video signal generator to the PROMPTER connector on the CCU rear panel.

Test Point : PROMPT connector/BVP-500/500P
Adjustment Points : ⊘RV2 (PROMPT LEVEL) / DM-99 (G-3)
Specifications : A = 1.00 ±0.05 Vp-p



Resetting after Adjustment:

- S1, S5, S6/DM-94 →customer-set position



DM-99 BOARD (A SIDE)

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's instructions.

Vorsicht!

Explosionsgefahr bei unsachgemäßem Austausch der Batterie.

Ersatz nur durch denselben oder einen vom Hersteller empfohlenen ähnlichen Typ.
Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

ATTENTION

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.

Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.
Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

ADVARSEL!

Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

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